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Experiments *and* Observations

ON

QUILLED AND RED

PERUVIAN BARK.

EXPERIMENTS AND OBSERVATIONS

ON

QUILLED AND RED

PERUVIAN BARK

AMONG WHICH ARE INCLUDED

Some remarkable Effects arising from the Action of
COMMON BARK AND MAGNESIA upon each other.

WITH

R E M A R K S

On the NATURE and MODE OF TREATMENT OF

FEVERS, PUTRID SORE-THROAT,
RHEUMATISM, SCROPHULA,

and other DISEASES;

In order to ascertain which BARK may be
administered—either alone or combined with other
Remedies—to the best Advantage.



TO WHICH IS ADDED,

A N A P P E N D I X

On the CINCHONA CARIBBEA

By THOMAS SKELTON, M.D.

L O N D O N :

PRINTED FOR J. MURRAY, No. 32, FLEET-STREET.

AND SOLD BY W. GREEN AND C. ELLIOT, BIRMINGHAM.

AND LACE WHITE AND W. GILBERT, DUBLIN.

MDCCLXXVI

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ON
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PERUVIAN BARK:

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WITH

REMARKS

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RHEUMATISM, SCROPHULA,
and other DISEASES;

In order to ascertain the Cases in which Bark may be
administered—either alone, or combined with other
Remedies—to the best Advantage.

TO WHICH IS ADDED,

AN APPENDIX,
On the CINCHONA CARIBBÆA.

By THOMAS SKEETE, M.D.

L O N D O N :

PRINTED FOR J. MURRAY, N° 32, FLEET-STREET;
AND SOLD BY W. CREECH AND G. ELLIOT, EDINBURGH;
AND LUKE WHITE AND W. GILBERT, DUBLIN.

M.DCC.LXXVI.

Experiments and Observations

ON

QUININE AND IRON

WILLIAM SAUNDERS, M.D. F.R.S.

PHYSICIAN TO THE ROYAL HOSPITAL, &c.

Some remarkable Effects arising from the Action of
common Quinine and Iron upon each other.

WALTER FARQUHAR, Esq.
F.R.S. F.R.C.S.

SURGEON
OF THE NATURE AND MODE OF TREATMENT OF

FEVER, PUTRID SORE-THROAT,
admirans venerabile donum

Fatalis Virgæ longo pass-tempore visum.

VIRG.
HENRY



as an author, who looks for
a patronage, which is likely to
procure him an indulgent atten-
tion from the public. To whom,
then, could this attempt be ad-
dressed with greater propriety than
to you, who, possessing an estab-
lished medical reputation, have at
the

DEDICATION
the same time been pleased to con-
for on me the modest offices of
WILLIAM SAUNDERS, M.D. F.A.S.

PHYSICIAN TO GUY'S HOSPITAL, &c. &c.

AND TO

WALTER FARQUHAR, Esq.

SURGEON.

GENTLEMEN,

WHEN a young practitioner
makes his first appearance
as an author, he naturally seeks for
a patronage, which is likely to
procure him an indulgent atten-
tion from the public. To whom,
then, could this attempt be ad-
dressed with greater propriety than
to you, who, possessing an estab-
lished medical reputation, have at
the

the same time been pleased to confer on me the kindest offices of friendship?

The pleasing recollection of the advantages which I have derived from one of you, during the prosecution of my medical pursuits, not only from your judicious practice as a Physician, but from your engaging excellence as a Teacher, cannot occur more forcibly at any time than at the present, when I am bringing forward the fruits of your instruction. The remembrance, too, of the disinterested services and attention which I have long experienced from both of you, must, on this, as well as on every occasion, call forth my warmest acknowledgments; and
if

if any thing can contribute farther to the pleasure which I feel in thus addressing you, it is the knowledge of the sincere esteem which you entertain for each other.

I cannot help trembling for the fate of this Essay: but, whatever difficulties I may have to encounter, that you may long enjoy the reputation which you have so deservedly acquired, is the unfeigned wish of,

GENTLEMEN,

Your faithful and

most obliged humble Servant,

Pater-Noster Row,

Jan. 24, 1786.

THOMAS SKEETE.

DEDICATION.

if any thing can contribute further
to the pleasure which I feel in thus
addressing you, it is the know-
ledge of the sincere esteem which
you entertain for each other.

I cannot help trembling for the
fate of this Library; but, whatever
difficulties I may have to encounter,
yet, that you may long enjoy this
treasure which you have to de-
serve, is the wish of
your devoted friend,
THOMAS SKELTON.

510 22 12

P R E F A C E.

THE Treatise, which is now submitted to the consideration of the Public, was originally written in form of a dissertation for one of the prize medals of the *Harveian Society* at Edinburgh, and had a reference chiefly, at that time, to the comparative powers of the red and quilled Peruvian Bark. The Society thought proper to honour it with a medal, although, from the hasty manner in which it was written, it was certainly in many parts faulty and imperfect. Engaged, indeed, as I necessarily found myself in academical pursuits, on my arrival at Edinburgh in the beginning of the winter 1783, the few leisure hours which remained would have been perfectly inadequate to any attempt of the kind at so late a period, had I not
a been

x P R E F A C E.

been induced to it from a consideration, that, during several years residence in Guy's Hospital, I had fortunately enjoyed opportunities, under the direction of Dr. Saunders, of becoming familiar, not only with the chemical nature of the Bark, but with its exhibition in a variety of diseases.—I was farther encouraged to enter into the enquiry proposed by the Harveian Society, in consequence of the promise of several confidential friends*, who resided, at that time, in the house with me, to assist in whatever additional experiments should be thought necessary in the investigation of the subject.

It was by no means my intention, in the beginning, to publish it to the world at large; though, in order to comply with the wishes of many of my friends, I determined, shortly after it was known to

* Dr. Hayle of Jamaica, Mr. Chapman of Barbadoes, and Mr. Galtkell, Surgeon at Redriff, gentlemen highly distinguished for their industry and integrity.

have obtained a prize, to print, when convenient, a few copies for their inspection; not thinking it sufficiently interesting to engage the attention of the profession in general. With the advice and concurrence, however, of my medical friends, I have at length ventured to deliver my sentiments publicly, in the expectation, that, on a subject so highly important, some observations may be found not unworthy of attention, especially as I have bestowed considerable pains, for some months past, in correcting and enlarging it.

Many of the experiments have been repeated in presence of men of great attention and discernment, particularly those from which the most important conclusions are derived, in order to guard, as much as possible, against the fallacy of experiments hastily conducted, or not sufficiently repeated and diversified.

The experiments with magnesia, which appear highly worthy of notice, are entirely added to the original ones; although I have not been very desirous of multiply-

ing or unnecessarily increasing their number, from the conviction, that a long enumeration of this kind often perplexes, and, so far from illustrating the subject, rather tends to render it more obscure.

The practical part of the Essay, or that relating to the exhibition of the Bark in various diseases, is considerably augmented, so as to contain, from my own observation, corrected and assisted by numerous authors, whom I have consulted for the purpose, the greatest part of what may be deemed useful on the subject. And, having thus carefully collected into one view, the detached articles of information, acquired by different persons, I cannot help flattering myself that my endeavours will be found in a great measure to facilitate the progress of students, and those more particularly who have not leisure or inclination to examine the various writers on *Materia Medica*, and on the practice of physic, who have treated of Peruvian Bark. The repetition and absurd theories with which many of these abound, tending
to

to obscure the knowledge which would otherwise prove useful and entertaining, first led me to form a selection, and to pursue a plan that seemed sufficiently desirable to compensate for any difficulties which might be encountered in the attempt. I am fully aware, at the same time, that, notwithstanding the extensive consideration which I have bestowed on this subject, there are some disadvantages, in which I shall necessarily find myself involved. There are many persons, who seem so thoroughly satisfied with the knowledge which they have acquired with regard to it, and who think that it has so frequently been discussed in medical writings, that little can now be added worthy of attention. The love of novelty, therefore, and the credit which is commonly annexed to it, cannot operate in the present instance. My claim to indulgence must arise from the attempt to render more perfect a subject, which, though previously cultivated to very excellent purposes, seemed still to admit of farther improvements.

ments. It is certain too, that, although many valuable experiments and observations have been published at different times on Bark, yet they have generally been on detached parts of the subject, not having been written with the view of bringing together the whole in one publication.

By entering somewhat into an examination of the nature, or most obvious conditions of many of the diseases which are enumerated in this treatise, I have endeavoured to point out the particular circumstances, under which Bark is more especially indicated, in order to determine how far its powers may be relied on, and in what situations it may be proper to employ other means, either to increase its efficacy, or fulfil indications, to which, in its separate state, it does not appear adapted.

Some may, perhaps, be ready to accuse me of too great a digression on many occasions. I trust, however, that I shall be excused by most of my readers, who may probably meet with some remarks, which,

though not strictly connected with the subject, will not, on that account, prove less acceptable.

If it should be objected to me, that I have not had sufficient experience to decide with propriety on many of the practical subjects which are treated of, it must be remembered, that, in all such cases, a careful comparison of the best practical authorities has been attempted; and although I should sometimes differ from the men to whom I am most indebted, it is no small satisfaction to me, that the observations which have enabled me to reason on the nature and treatment of different diseases, have been derived, not only from the extensive opportunities and instruction afforded by Dr. Saunders, but by Dr. Thomson and Dr. Hervey, the other physicians to Guy's Hospital, to whom, also, I consider myself much indebted for their polite attention. Nor can I forbear, at this time, expressing my acknowledgments to Dr. Gregory of Edinburgh, for the practical information which I had the

pleasure of receiving from him, during my attendance on the clinical wards of the infirmary at that place, and on his clinical lectures.

As perspicuity is far more desirable, in writing on all subjects of science, than any ornaments of style, I have endeavoured, throughout the whole of this treatise, to render my meaning as intelligible as possible: if I have attained this, in the opinion of my readers, I shall receive great satisfaction.

I cannot help regretting that the learned and ingenious observations of Sir George Baker, on the history of Peruvian Bark, and the circumstances attending its first introduction into Europe, published in the 3d volume of the Medical Transactions, did not fall into my hands soon enough to permit me, in treating of that part of the subject, to avail myself of any of the curious facts which he has endeavoured to establish.

It may not be improper to mention in this place, that I have been engaged, for
some

some time past, in prosecuting a train of experiments with Opium on men and different animals, and in collecting practical observations with regard to it, which I propose to publish at some future opportunity, should the present treatise meet with the countenance and approbation of the profession. Many of my friends must be sufficiently aware, that the experiments to which I allude were, in the beginning, instituted for the purpose of an inaugural dissertation; but, as I found, in the course of the pursuit, that my views could not be comprehended in such a performance, I soon desisted from that attempt. I have been constantly accumulating observations, however, on the subject, so as in time, I trust, to enable me, in some measure, to reconcile the contradictory opinions which at present subsist among medical men, concerning the nature and properties of this celebrated remedy.

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ERRATA.

Page 2, line 16, for drunk, read drank.

95, — 12, for nor, read or.

96, — 10, for exceeding, read exceedingly.

108, — 16, for near, read nearly.

135, — 13, for antizimick, read antizymick.

220, — 21, after 4th edition, insert volume.



PART

PART I.

SECTION I.

OF COMMON PERUVIAN BARK.

CHAP. I.

General History and sensible Properties of the Bark.

IT is not my intention on the present occasion to enumerate the great variety of names, by which different authors and persons have distinguished this article, with the circumstances from which they have originated; as these are to be found in most of the books on *Materia Medica*, and are particularly noticed by *Dr. Alston*. The title of *Peruvian Bark*,

2 *Of common PERUVIAN BARK.*

or that of *Cinchona Officinalis*, of *Linnaeus*; derived from the celebrated cure of an intermittent fever, which was performed by it in the case of the Countess of Cinchon, soon after its discovery, is sufficient for every useful purpose; the terms of *Quinquina*, *Pulvis Patrum*, *Pulvis Cardinalis de Lugo*, &c. &c. being seldom heard of at this day, and rather leading to ambiguity than to any real utility.

For the same reasons, it would be unnecessary, I conceive, to dwell on the period of its introduction into practice; on the accidental discovery of its virtues, in consequence of an Indian, who, labouring under an intermittent, drunk of the water of a lake, which contained some of the branches of the tree; on its being first brought into Europe about the year 1640; on its having fallen into disrepute for a time; and on its happy restoration by Sydenham, Morton, and Torti. It is sufficient to observe, that after the celebrated physicians just mentioned, the excellent qualities of this remedy have been so fully

4 B 2 established

Of common PERUVIAN BARK. 3

established by Hoffman, De Haen, Pringle, Oglethorn, and by so many other practitioners of eminence, that there is little reason to fear its ever sharing the same undeserved fate again.—We may almost indeed venture to assert, that this will never happen while medicine continues to be cultivated, and the remedy can be procured in its genuine state.

The most accurate account that has been published of the plant which furnishes the Peruvian Bark, is that of Condamine, in the Memoirs of the Royal Academy of Sciences of Paris, for the year 1738; from which most of the other descriptions have been copied, and from which likewise Linnæus was led to refer it to the class *Pentandria*, order *Monogynia*, of his sexual system, under the name and genus of *Cinchona*.

Two species only are described by this naturalist, viz. the *Cinchona officinalis paniculata brachiata*, and the *Cinchona pedunculata uniflora*. The first of these is the only one which I propose to consider at

4 *Of common* PERUVIAN BARK.

present; as the other, which is a native of the Caribbee Islands, will occur with greater propriety in the Appendix, in treating of the Jamaica and St. Lucia Bark.

The trees which produce the Peruvian Bark grow in great plenty in different parts of Peru, but particularly on the hills near the city of Loxa, and on Mount Cajanuma. It is said by some to be a tall slender tree; by others to be of a middling size only. Pomet compares it to the size of a cherry tree; but Condamine, whose account is most to be depended on, observes, that when he was in Peru, he did not see a tree which exceeded the thickness of a man's arm, and which was more than twelve or fifteen feet high.

There is reason, however, to think that these were not very old, as it has been found that they often die from being stripped of the bark, and consequently that the tree is capable of greater dimensions.

It is

Of common PERUVIAN BARK. 3

It is said that the trees are propagated by the spontaneous scattering of the seeds, which, together with the leaves and flowers, are in perfection at every season of the year.—The Bark, according to Arrôt's account in the 40th volume of the Philosophical Transactions, is separated from the tree, during the months of September, October, and November, at which time the rains cease; but it should seem that it may be collected at any other period of the year, provided it can be properly dried.—During the exposure of it to the sun and air, it is necessary that it should be frequently agitated, in order that it may be uniformly deprived of moisture, and rendered fit for the market.

Some prefer the Bark of the branches, while others affirm that the trunk and root of the tree furnish it in a more powerful and valuable condition. The fruit and seeds have been supposed to possess powers similar to those of the Bark—this, however, does not appear to have been sufficiently ascertained, and if it could even be

6 *Of common PERUVIAN BARK.*

proved that it is the case, there is reason to suspect that they could scarcely be supplied in sufficient quantity to render them an object of attention for medical purposes. It would be well, indeed, if any method could be adopted of obtaining the seeds, with a view to the introduction of the plant into different parts of the East and West Indies.

Three species or varieties of the Bark have been generally distinguished, viz. the white, the yellow, and the red; but some enumerate a greater number; thus Newman* informs us, that Vaillant, a celebrated botanist of Paris, assured him that he knew six sorts, and confirmed the account given by Lemery and Pomet, that Potosi affords the best.—The white Bark is chiefly found on the tops of the mountains, and is supposed to be much affected by cold, to which, from its situation, it is more especially exposed. The yellow and red, on the contrary, are said to grow at a great distance from it; being found in the

* See Newman's Chem. Works, by Lewis, 4to, p. 339.

Of common PERUVIAN BARK. 7

lower parts of the mountains, where the wind and cold are less liable to produce any unfavourable effect upon them. — Condamine remarks, that with regard to the powers with which they cure diseases, the red greatly excels the others; and adds, that the white appears to be a peculiar species, while the yellowish and red do not essentially differ: but this, with what farther relates to the natural history of Peruvian Bark, and the different botanical accounts of it, must be referred to the second section of this part of the Essay, where the subject of red Bark, and its connection with the common and quilled, will be more fully discussed.

The common Peruvian Bark is brought to us in pieces of different sizes; some rolled up in short thick quills; others of a greater length, thinner, and twig like; some altogether flat, and others again rounded, but not forming quills. Externally, the Bark is either of a brownish, greyish, of a blackish brown, or sometimes even of a black colour, and often covered

8 *Of common* PERUVIAN BARK.

in part with a whitish moss; internally, of a yellowish, reddish, or rusty iron colour.—That which is good of either of these varieties, should break close and smooth, appear resinous, and prove friable betwixt the teeth. The inferior kinds exhibit more of a ligneous texture, are often large, thick, and of a paler colour, and in chewing separate into fibres. The Bark of the former description, is supposed by several of the writers on *Materia Medica*, to pulverize more easily than the latter, and when powdered to be of a light brownish colour, resembling that of cinnamon, but somewhat paler.

Some persons consider the small, thin, flat pieces of Bark as the best; but the quilled sort with the roughest coat, especially if of a bright cinnamon colour on the inside, is held by many in the highest estimation.—Some again prefer that kind which is black, or nearly so, on its external surface; while others believe that the larger flat pieces, of a reddish colour, are often of equal, if not superior efficacy.

The

Of common PERUVIAN BARK. 9

The Bark which was brought from America some years ago, under the title of Female Peruvian Bark, is described as having been considerably thicker than the genuine; whiter on the outside; redder within, and weaker in smell and taste than the true Bark. This was found from experience to be much less effectual than the genuine sort, which it was frequently mixed with, or substituted for, in France; infomuch that its importation was prohibited by law.

A remarkable difference in the quality of the Bark kept by the druggists, is evident from the different prices which it always bears in their shops. Having repeatedly heard that it could be purchased for any sum between the extremes of two and ten shillings, I have been led more particularly to inquire into the condition in which this article comes into their hands; and, as it is certainly a subject of great importance, I shall insert in this place every circumstance that I have been able to ascertain concerning it.—If
my

10 *Of common PERUVIAN BARK.*

my information can be depended on, and I have every reason to think that it has been derived from the most genuine source, the Bark is originally brought to market in three forms; viz. the common, the second or middling, and the best. — The chests of common Bark weigh about two hundred and fifty pounds each, and in these there is scarcely any thing but the coarse woody pieces; which, however, are not thrown away, but are chiefly used for powder and making into tinctures. — The chests of the second, which are much of the same weight, are made up of a mixture of bad and good, and are those which the Druggists garble or separate into different parcels; they yield each, upon an average, twenty-five pounds of quilled Bark, and as much of coarse or common, while the remaining part constitutes the standard middling Bark, which sells in general at about five shillings per pound. — The best kind, which seldom weighs above one hundred and twenty or thirty pounds per chest, is almost all of the twig and quilled

Of common PERUVIAN BARK. II

quilled Bark, and is only sifted before it is sold. This now and then bears the high price of ten or twelve shillings per pound, but may be purchased in general for seven or eight.

After the circumstances just enumerated, it must be obvious that every practitioner should make himself well acquainted with the different appearances which the Bark is capable of assuming, so as to be able to judge readily of the comparative powers of any number of parcels of it, and to distinguish with accuracy that kind which may be administered with confidence, in a variety of instances where the efficacy of good Bark has been fully established. I have more than once known this remedy exhibited in a state of the most pressing danger, when it was of so indifferent a quality, that scarcely any other effect than that of unnecessarily loading the patient's stomach, could be expected from it.

The Bark is described by Lewis * as having "a light smell, approaching to

* See Lewis's Mat. Med. p. 485, &c. last edition.

"mustiness,

12 *Of common* PERUVIAN BARK.

“multifness, yet so much of the aromatic
“kind, as not to be disagreeable. Its taste
“considerably bitter, astringent, very dur-
“rable in the mouth, and accompanied
“with some degree of aromatic warmth,
“but not sufficient to prevent its being
“ungrateful.”——Most of the authors
that I have consulted agree with him
in ascribing bitterness, astringency, and
aroma to this article; some indeed insist
more upon the aromatic property of the
Bark than he seems to have done.

With respect to these qualities, as far as
the smell and taste can direct us, I am of
opinion that no aroma is discoverable in
the Bark by either; but this will be de-
cided more particularly by Experiments
soon to be related.——That it is confi-
derably bitter, no one, I imagine, will
doubt. Dr. Alston remarks, that the bit-
terness is not immediately perceived on
chewing it, but continues long in the
mouth; insomuch, that after chewing a
little of it, which had been kept more than
twenty years, this quality continued per-
ceptible

ceptible on the tongue full three hours*. The same author observes, that Peruvian Bark is but very slightly astringent, for that on tasting many samples of it, of different ages, he could sometimes perceive no stypticity, at other times a little roughness or dryness on the tongue, and on other occasions it appeared subastringent, like dried sorrel roots. It is very certain, that the astringency of Bark, when compared with the *Gum Kino* and many other astringents, is inconsiderable; but that it clearly possesses this quality in a greater or less degree, is proved not only from the taste, but from the change of colour and precipitation, which the preparations of iron produce when added to different infusions and decoctions of it. I have always found, upon mixing a solution of sal martis in water with these, unless they were exceedingly weak, that a dark-coloured precipitate was the consequence; hence I conclude that Dr. Alston must have been mistaken in alledging,

* See Alston's *Materia Medica*.

that

14 Of common PERUVIAN BARK.

that a green colour only resulted from such additions. When indeed the preparations of Bark were very weak, the beautiful green colour which he speaks of was produced; the liquor likewise remaining in the other experiments, after the precipitation of the dark-coloured part, was generally green.

From what has been said, it would seem to follow, that in making a choice of Bark, we should not only attend to the marks of goodness discoverable by the eye, which have been already fully enumerated, but that we should also direct our attention particularly to the degree of bitterness and astringency, by chewing some of it carefully, and giving the preference *ceteris paribus* to that which makes the most powerful impression on the taste. As to the smell, it is difficult to describe it, farther than by observing, that it possesses a peculiar kind of mustiness, by which it may be distinguished; for I have not been able to annex any idea of an aromatic property to it.

C H A P. II.

Of the Analysis of quilled Bark, with a Comparison between it and the flat Species.

MANY experiments have been made on Bark by Dr. Percival and others, but the conclusions drawn from the investigations of that respectable physician have been more generally received than any I am acquainted with. This circumstance has induced me, in the course of my inquiries, particularly to keep in view his ingenious Essay on Astringents, and although I should be ready to confirm many of his observations, I have been under the necessity, after repeated trials, of differing very essentially from him in several important particulars. I do not mean to suggest, that the result of any experiment, performed exactly after his method, has

C H A P.

been

been so much different from that which he has described, as that by diversifying the experiments, and contrasting them with others which did not occur to him; in short, by entering into the subject of Bark itself to a greater extent than he has done, I have perceived that some of his conclusions are so far from being supported by sufficient premises, that I am certain, upon a more careful examination, this candid philosopher will be ready to relinquish them.

It is well ascertained, that the only method of conducting the analysis of any particular vegetable matter, is by subjecting it to the action of various chemical substances, with the view of observing either the effects of solution and mixture on the one hand, or of decomposition on the other; for, as the true nature of vegetables is so remarkably altered by the force of fire, that similar products are obtained from those of the most opposite qualities, it is evident that little can be expected from such a source, however powerful and efficacious

cacious it may be in discovering the real constituent parts of a variety of subjects belonging to the mineral kingdom. —Having judged it admissible, notwithstanding, to try the effects of heat moderately applied to the Bark, in order to determine how far it consists of volatile parts; or, in other words, what foundation there is for the aroma, which has been so generally ascribed to it, several experiments were accordingly performed for this purpose.

Every other substance, which is said to be aromatic, may be made to yield in distillation, either an essential oil (which may be collected), or impart an odour to water or spirit of wine; and, after having given out the essential oil, the residuum is found dispossessed of aroma; a plain proof that this quality depends on an essential oil. If Bark then be aromatic, the same consequences should result from its distillation. Whether this is the case or not, the following experiments will assist us in determining.

18 *Of common PERUVIAN BARK.*

EXPERIMENT I.

To half an ounce of the best quilled Bark well bruised, were added eight ounces of pure water, in a proper distilling apparatus. The fire was raised very gently, until about two ounces of liquid were collected in the receiver. On examination, it was found to possess scarcely any flavour, nothing that could with propriety be called aromatic; for there was just enough of the Bark to be perceived to lead to the suspicion of the materials with which the distillation had been conducted.

EXPERIMENT II.

To half an ounce of the same kind of Bark, reduced to a coarse powder, were added eight ounces of proof spirit in a distilling apparatus, and these were treated in the same manner as in the last experiment. The liquor collected in the receiver being subjected to examination, discovered no traces of the Bark, which either the smell or taste could discern in the smallest de-

Of common PERUVIAN BARK. 19

gree. The effect of a chalybeate solution was tried with the product of this, as well as of the foregoing distillation, but produced no change on either.

Two distillations were made with the *Cascarilla Bark*, one with water, and the other with spirit, in the same proportions, and under similar circumstances to the last experiments, in order that a comparison might be instituted. To both it communicated a strong impregnation, but more powerful to the water than the spirit, the former of which was exceedingly grateful*. The *Cascarilla*, then, is with much justice said to be aromatic, while the aroma, ascribed to Peruvian Bark, appears to rest on a very slight foundation.

I thought it particularly necessary to inquire fully into this circumstance, since most writers lay great stress on the suppos-

* The simple distilled water of *Cascarilla* partakes so strongly of the useful Bark from which it is prepared, that I should beg leave to propose keeping it hereafter in the shops, on the same, if not on a better footing, with the distilled waters in common use.

20 *Of common* PERUVIAN BARK.

ed aroma, and condemn certain forms of the Bark, from the idea that it is dissipated during their preparation. Farther, it is well ascertained in many instances, that the efficacy of this valuable remedy is promoted by the addition of different aromatics; which would be joined still more frequently perhaps with it, were practitioners at pains to inquire whether it really possesses the quality in question or not.

The processes of distillation from which the above conclusions are drawn, were at first conducted in the laboratory of Guy's Hospital; by my worthy friend, Mr. Babington, to whom I am indebted for numerous advantages, which I derived in every branch of the profession; during the time which I had the pleasure to reside in the house with him.

As I had the fullest confidence in his accuracy and skill, in every chemical investigation which he should attempt, I did not, in the first instance, hesitate to assert with him, that no essential oil was contained in Bark, the want of a proper apparatus
at

at Edinburgh having prevented my conducting the distillations, at that place, with the accuracy and expedition which was necessary.—A contrary opinion, however, having been maintained by Mr. Irving, in his Treatise lately published on this subject, I have since that time repeated the distillation of Peruvian Bark in water, and submitted the result of the process to the examination of such gentlemen as happened to be at the hospital on the day of performing it. The liquor which was collected in the receiver could not, on the strictest examination, be perceived to contain any thing like an essential oil. To several persons it appeared almost intirely destitute either of smell or taste; while others thought there was a flavour sufficiently characteristic of Bark, to enable them to determine that it had been employed in the distillation. Mr. Irving indeed confesses, that in his experiment (See page 29), the water had but a very faint taste of the Bark, and yet he afterwards (p. 31), concludes that it loses much of

22 *Of common* PERUVIAN BARK.

its aroma by boiling. Now, if it were even proved that Bark possessed an aroma, or essential oil, on which the smell of the distilled liquor depended, it would surely not be an admissible conclusion, that much of this principle was dissipated, when it could scarcely be rendered obvious to the taste. But it will be sufficiently apparent, I trust, that the Bark either contains no essential oil whatever, or at any rate so small a proportion as not to enable us, in the slightest degree, to attribute any of its medical virtues to such a principle; or from thence to explain its operation.

To bring this subject to a more decided conclusion, I would observe, that it is by no means necessary to suppose the presence of an essential oil in every substance which makes an impression on the organs of smelling. No person, I imagine, will refer the pungent odour of volatile alkali, or of volatile sulphureous acid, to this source. All that seems required, for the purpose of constituting the state of substances in question, is, that some of their
finer

finer particles should be volatile enough to mix with the air which is to be applied to the nostrils; and there are innumerable instances of bodies which can be distinguished by the smell, in which an essential oil has never been suspected.—Gentian Root, for instance, may be readily known in this way; but there is scarcely an article in the *Materia Medica* more remote from any idea that we can form of an essential oil, or of any aromatic quality. I was induced, on this account, to distil a quantity of this substance with water, in order to form a comparison between it and Peruvian Bark; and it was obvious, not only to myself, but to Mr. Babington and most of the gentlemen who examined it, that the Gentian imparts just as much of its qualities, in such a process, discoverable to the smell and taste, as Bark does. But we cannot, on that account, infer, that either the one or the other contains an essential oil, especially when we compare them with the distillations of mint, cinnamon, cascarilla, orange peel,

24 *Of common* PERUVIAN BARK.

&c. which are with the strictest propriety said to be aromatic substances, and which by the process are dispossessed of their active and useful properties.

It appears to me, that the slight smell of the condensed liquor, in the distillation of Bark, arises from a few of the finer resinous particles, which are raised by the heat, and are more numerous in proportion as it is more quickly applied; hence, in making decoctions of the Bark, if the heat be very suddenly applied, we may frequently observe a kind of resinous pellicle on the surface of the liquor, shining sometimes in such a way, as to give the idea of something oily having been poured upon it. I cannot help thinking, that it has been some appearance of this kind, which has been mistaken by Mr. Irving and others for a real essential oil, supposing a microscopical deception, which has so frequently happened in philosophical investigations, even out of the question. Mr. Irving expressly mentions (p. 29), that he conducted his distillation by means of a brisk

a brisk heat; a circumstance which we are always directed by chemical writers to avoid, as the more moderate the degree of heat, above a certain point, the more perfect is the essential oil which we obtain.

—A strong heat endangers the production of an empyreumatic oil, which may be obtained from substances entirely destitute of any essential oil.

Having ascertained that Bark consisted chiefly, if not entirely, of *fixed parts*, I directed my attention, in the next place, to these, in order to form some satisfactory conclusions with respect to their nature, as discoverable by various additions, and especially by the operation of different *menstrua*. With this view I made the following Experiments.

EXPERIMENT III.

Two drachms of best quilled Bark, reduced to a tolerably fine powder, were added to two ounces of *proof spirit*, and these were suffered to remain together nine days, the vial having been well agitated three times

26 *Of common* PERUVIAN BARK.

times a day. The tincture was then passed carefully through common filtering paper. In order to determine exactly how much the Bark had lost in this experiment, I filled a vial, capable of containing by measure ten drachms of fluid, with some of the same spirit from which the tincture had been made, and, having weighed this accurately, poured out the spirit, and filled it with the tincture, which weighed four grains more. It was determined in this way, that the two ounces of spirit must have dissolved six grains, or somewhat more, of the Bark. I considered this a more certain method of discovering the comparative powers of different solvents or *menstrua*, than that employed by Dr. Percival*, as it must be exceedingly difficult to restore any powdery substance to the exact state of dryness which it possessed before the experiment, without some portion of it being dissipated, or accidentally lost.—According to the method which I adopted, the vial was filled above the

* V. Percival's Essays, Vol. i. page 91.

neck,

neck, which was very small, in such a manner that the increase or diminution of a single drop caused an evident difference. Concluding it to be sufficiently correct, I resolved to perform all my experiments in a similar way, not however without repeating many of them more than once, in order to ascertain their truth with greater certainty, and to guard thoroughly against any deception from the eye in filling the vial to the exact mark.

EXPERIMENT IV.

Two drachms of Bark, under the same circumstances as in the last experiment, were added to two ounces of *rectified spirit of wine*, and after being nine days together, the vial having been agitated from time to time, as in the experiment with the proof spirit, the tincture was filtered. I was much surprised on finding that the vial already mentioned, when filled with some of it, weighed fourteen grains more than the same vial filled with the pure rectified spirit. Although I could
plainly

plainly perceive, from the appearance of the tincture, that it was of considerable strength, I nevertheless repeated the experiment of weighing it several times, with the view of determining its specific gravity; and in every instance found the result the same.

Dr. Percival seems to doubt the superior solvent power of rectified spirit; and Dr. Lewis, although he allows it to be preferable to proof spirit, does not attempt to calculate in what proportion. In the trials which I have made, the difference has certainly proved very remarkable, being at least three to one in favour of the pure rectified spirit of wine.

Having ascertained the fact, it may not be improper to inquire how far it corresponds with other chemical phenomena, and admits of an explanation upon the principles which have been observed to regulate this beautiful and valuable science. It is well known that spirit of wine attracts and dissolves resinous bodies, that spirit and water have a strong chemical attraction

tion for each other, and that water possesses a similar attraction for all mucilaginous substances. It was reasonable therefore to expect *a priori*, that proof spirit should prove a better *menstruum* for Bark than rectified, the spirituous part being adapted to the resin, and the watery to the mucilage; for we shall afterwards find more particularly, that the Bark, as well as many other vegetable substances, consists both of mucilaginous and resinous parts.— Upon what circumstances then does it depend, that proof spirit is not accordingly a more powerful solvent than rectified? I am disposed to think that it is closely connected with one of the general principles or laws which regulate chemical attractions; viz. that the attraction, exerted among the constituent parts of bodies, is weaker in proportion as they are more compounded. Thus, in the substance called sulphur, the vitriolic acid is found to attract *phlogiston*, or the principle of inflammability, so strongly, that the air of the atmosphere, which also attracts *phlogiston*,

giston, is unable, in the ordinary state of temperature, to effect a separation, or to decompose that compound; but if a fixed alkaline salt be added to the sulphur, forming with it a *Hepar Sulphuris*, the attractions are then so much divided, that the air is soon enabled to effect the decomposition; leaving, in place of the hepar, a quantity, either of vitriolated tartar, or Glauber's salt, according to the alkali employed*. — I apprehend that something similar happens in the instance at present under consideration, viz. that the attraction between the water and spirit is so great, as to weaken the attraction of the former for the mucilaginous part of the

* Some persons may perhaps be inclined to object to any illustration which supposes the existence of phlogiston. I am sufficiently aware that several ingenious attempts have been made to annihilate this principle, though, in my mind, they have been far from answering the desired purpose. — But, whatever may be my own opinion, I am warranted in having recourse to the above explanation, since the doctrine connected with phlogiston is still maintained by Dr. Black, and by several of the most respectable English philosophers.

Bark,

Of common PERUVIAN BARK. 31

Bark, and that of the latter, or spirit, for its more resinous particles.

That the inference which has been drawn in favour of rectified spirit should be subjected to a farther examination, the effects of precipitation by water were tried on both the tinctures. The sediment from the tincture with rectified spirit, upon the addition of one drachm of it to an ounce of water, proved considerably greater than that with the proof spirit under similar circumstances. I attempted likewise to arrive at a still greater degree of certainty, by evaporating the precipitated matter to dryness, after pouring off as much as possible of the transparent part of the liquor; but found that no exact comparison could be made in this manner, as many of the resinous particles are unavoidably dissipated by the heat, independent of the difficulty of reducing the different precipitates to an equal state of dryness by an uniform and well-regulated degree of temperature. It is clear, however, that the whole of the Bark, which either proof or rectified spirit dissolves,

cannot

32 *Of common* PERUVIAN BARK.

cannot be precipitated by the addition of water; for both of the transparent liquors retained the flavour of Bark, and became discoloured on the addition of a chalybeate solution. This makes it probable, that the mucilaginous parts of the Bark are so intimately blended with the resinous, that the spirit extracts a part of the former as well as the latter: for, if the resin only were dissolved, we should expect the whole of it to be precipitated by water, as happens with common resin and spirit, the attraction between water and spirit being greater than that of the latter and resin. It must be acknowledged, at the same time, that spirit extracts the resinous parts of the Bark chiefly, while water unites itself with those which are of a mucilaginous nature; but it seems obvious, notwithstanding, that, both in spirit and in water, all the different parts of Bark may be rendered sensible in a greater or less proportion.

EXPERI-

EXPERIMENT V.

Two drachms of the same kind of quilled Bark, as that employed in the preceding experiments, reduced to a moderately fine powder, were triturated briskly, for the space of an hour, with four ounces of soft water, and after remaining together a few minutes, the liquor was passed through filtering paper. The vial filled with it, weighed three grains and a half more than an equal measure of the water from which the infusion was made.

EXPERIMENT VI.

Two drachms of Bark, in a condition similar to that of the last experiment, were boiled, during the space of an hour, in seven ounces of water, to about four ounces, which being poured off, and suffered to cool moderately, was then carefully filtered. The vial, when filled with it, weighed five grains and a half more than a similar measure of the water from which it was prepared,

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pared,

34 Of common PERUVIAN BARK.

pared, and exceeded the infusion consequently in specific gravity in the proportion of two grains.

EXPERIMENT VII.

To half an ounce of the infusion of Bark, was added one drachm of a solution of *Sal Martis*, prepared with sixty grains of the salt, and three ounces of pure water. A very slight change only was observed at first, but after remaining some time at rest, a small quantity of a greyish coloured sediment could be distinctly perceived, while the transparent part of the liquor exhibited a green appearance.

EXPERIMENT VIII.

To half an ounce of the decoction, was added the same quantity of the chalybeate solution as in the last experiment, but with a very different result, as the mixture, in this instance, immediately became turbid, and very dark coloured. After remaining

Of *common* PERUVIAN BARK. 35

maining at rest, too, the same length of time as the other, the precipitate had by no means subsided intirely to the bottom of the glass, the quantity of it appeared to be so very considerable.

From these experiments, I am led to conclude, that heat promotes the action of water upon Bark, and consequently, that a decoction of it, prepared over a slow fire, is a more efficacious preparation of this valuable remedy than the cold infusion, although contrary to the opinion of Dr. Percival * and many others. I was unable to perceive that the flavour of the Bark is injured by the boiling, provided it be conducted with care. It is true that the taste of the decoction is more bitter, and therefore more disagreeable, perhaps, than the infusion; but it cannot be expected to happen otherwise, when it is considered that an equal measure of the decoction contains a greater proportion of the active parts of Bark, evinced not only by its spe-

* Percival's Essays, Vol. i. p. 69, &c.

36 *Of common* PERUVIAN BARK.

cific gravity, but by the chalybeate, with which it exhibited marks of greater strength than the cold infusion*.

In treating of the different preparations of Bark, some additional remarks on the present subject will be introduced; but it may be proper in the mean time, as the result of my experiments varies essentially from that which has been published by Dr. Percival, to explain more particularly in what circumstances the method of preparing the infusions and decoctions varied. In Dr. Percival's experiments they were both strained through linen rags; but as it was an object to obtain that portion only of the Bark which was in a state of complete solution, I considered it more accurate to pass them through filtering paper, which was accordingly the method

* It is admitted by Dr. Black, and by many other able chemists, that the moderate application of heat promotes the action of water upon vegetable matter; and that it should prove different with Peruvian Bark seems highly improbable, if it were even out of our power to determine it by actual experiment.

that

that I adopted. Besides which, he prepared the cold infusion, by keeping the Bark in cold spring water forty-eight hours, while mine was obtained by triturating it for the space of an hour with the water, which I should expect would produce effects equally powerful, unless the vessel in the former case was constantly agitated; for in both instances, the intention is obviously, that of exposing fresh surfaces of the materials, in order that the *menstruum* may have a fair opportunity of exerting its action. Dr. Percival himself, indeed, in his succeeding experiments, allows, that an infusion may be prepared in a few hours, equal, if not superior in strength to one which has taken a much longer time. My reason for preparing the infusion, which I wished to subject to the purposes of experiment, by the most expeditious process, was, because we are under the necessity of being influenced in prescription in general by a similar motive.

38 *Of common* PERUVIAN BARK.

EXPERIMENT IX.

Two drachms of quilled Bark in powder, were triturated with two ounces of lime water, three quarters of an hour, and after remaining together about fifteen minutes more, the mixture was passed through filtering paper. This infusion was of a red colour, resembling in a good measure that of a tincture of the same Bark in proof spirit. It was remarkably more bitter to the taste than the cold infusion in simple water, though the increase of weight by no means corresponded with its sensible properties, the common measure of it scarcely weighing one grain more than that of the plain infusion.—This is a circumstance difficult of explanation, as it was reasonable to suppose, from the difference in the taste and appearance, that the lime water had dissolved a much greater proportion of the Bark than we can possibly deduce from the specific gravity of the infusion. But if the absolute weight of
the

the Bark be not much diminished by the action of such a *menstruum*, it certainly appears, from every other trial, to have dispossessed it of its active properties in a proportion vastly superior to common water. A tea-spoonful, for instance, of the solution of *Sal Martis* being added to some of the above infusion, immediately rendered it very turbid and dark coloured, and soon occasioned a copious precipitation of a blackish colour.

Equal parts of the transparent infusion, prepared with lime water, and of water thoroughly impregnated with *fixed air*, were mixed together, but with no other effect than that which seemed to arise from dilution; for, after remaining at rest a whole day, the liquor continued clear, and without the slightest appearance of precipitation. From this experiment it is probable, that the lime and Bark, in such a preparation, are so chemically united, that the addition of fixed air is insufficient to produce a decomposition. We must at least believe this to be the case with that

40 *Of common* PERUVIAN BARK.

portion of aerial acid which is capable only of being mixed with water; but if a large proportion of it be thrown through a quantity of the infusion from the pipe of a proper apparatus, the Bark is soon obliged to part with the lime. It is rendered sensible, partly by precipitation, and partly by the thin crust of calcareous earth, which may be made to appear on the surface of the liquor; the infusion at the same time losing the rich red colour which has been described.

This diversity in the effect of different proportions of fixed air, is agreeable to the laws which frequently regulate chemical affinities. It is not uncommon to find substances producing decomposition, when employed in a large proportion, which in a smaller could occasion no alteration whatever in the compound.

If a little of the *acid of sugar*, however, which attracts lime more powerfully than fixed air does, be added to an infusion of Bark prepared with lime water, a pre-

Of common PERUVIAN BARK. 41

a precipitation is immediately the consequence with a discharge of the colour.

The action of lime upon Bark in different proportions is worthy of observation. Having ascertained, that in the small quantity dissolved in lime water, it increases the sensible properties of this remedy; and being fully satisfied, from what I have seen, as well as from the experience of others (to be mentioned more at large in treating of the different preparations of Bark) that it is an useful remedy in particular diseases; I next determined to try the effects which would be produced on the Bark by a large proportion of the same substance.

EXPERIMENT X.

Two drachms of Bark in powder, and one drachm of pure lime, were accordingly carefully rubbed in a mortar, for the space of half an hour, with four ounces of pure water, and in proper time the mixture was filtered. Instead of the rich red colour

lour which the infusion with lime water exhibited, the present infusion seemed to possess scarcely any of the properties of the Bark. It tasted strongly of lime, and gave the slightest marks only of astringency when mixed with some of the chalybeate solution.

The lime in a large proportion appears evidently to unite with the Bark, and to form a new compound, possessed of properties different from those which either of them exhibited in their separate condition. The result of the above experiment is exactly similar to that of Dr. Percival's *, where he says, that upon making an infusion, with half an ounce of Bark, two drachms of lime, and six ounces of water, he found it strongly impregnated with the lime, and with an extremely disagreeable flavour, possessing but a slight degree of bitterness, and destitute of astringency. But it does not, on that account, justify the same conclusion which he has adopted;

* Percival's Essays, Medical and Experimental, Vol. 3. p. 65, 66.

for not having been aware of the different effects which arise from different proportions of lime, he condemns, on the strength of this experiment, every preparation of Bark into the composition of which it enters; and has thus, I am afraid, led many persons to reject the useful infusion which is prepared with the lime water, and which was not made the subject of investigation by him.

These different, and even opposite effects, arising from the lime employed in the two methods which have been related, are not surprising, when compared with a variety of chemical phenomena. There are numerous instances in which compounds exhibit appearances extremely different, according to the difference in the proportion of the constituent parts. This cannot be better illustrated, than by the union of *vitriolic acid* with the *principle of inflammability*. Certain proportions of these constitute volatile sulphureous acid, an active and pungent compound, with numerous properties, which readily distinguish

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44 *Of common* PERUVIAN BARK.

it from the insipid, inactive, and insoluble compound called sulphur, in which the acid is united with an increased proportion only of the same principle of inflammability or phlogiston. And thus a small quantity of lime, that, viz. contained in lime water (one grain to one ounce), increases the solubility of the active parts of Bark in water, while a large quantity completely alters its nature, and renders it insoluble in the same *menstruum*.

Dr. Macbride, in his Essay on the dissolvent power of quicklime*, suggested, among a variety of other substances, the addition of lime to Peruvian Bark, in order to obtain a more complete solution than in simple water, and at the same time to improve it as a medicine; but, to my great surprise, he directs Bark and lime to be first rubbed together, and lime water added afterwards, by which means the infusion that he obtained, must have been very inferior in efficacy to that which

* Experimental Essays, 3d edition, p. 242.

is prepared simply by triturating the Bark with lime water. This circumstance explains why Dr. Percival should differ from him, as it was natural that he should imitate the process recommended in Dr. Macbride's Essays; and not finding this succeed, it is no wonder that the more efficacious preparation with Bark and lime water only, should have escaped his observation.

It is almost unnecessary to mention the theory of the action of lime upon Bark and other substances, which was advanced by Dr. Macbride; for though ingeniously supported, it has been necessarily laid aside by later and more accurate investigations on the subject of fixed air. If the Bark were rendered soluble, as he thought, in consequence of the separation of fixed air by means of the lime, this last should be completely precipitated from the infusion made with Bark and lime water; as the quantity of it is so exceedingly small, that a sufficient proportion of fixed air would certainly be furnished by the Bark, to convert

46 *Of common* PERUVIAN BARK.

vert it into crude calcareous earth. That this does not happen, is plain from the precipitation which the infusion readily yields upon the addition of acid of sugar, or fixed air, when properly managed.

The next and last experiment with Bark and lime water, was made with a view of ascertaining the effects of heat upon them; for which purpose two drachms of Bark, and six ounces of lime water, were carefully boiled together, till about one third was consumed. The liquor, when filtered, was of a reddish colour, similar in appearance and strength to the infusion prepared with the same materials.

During the time that I was engaged in repeating the experiments which I had formerly made at Edinburgh, and in performing some additional ones, Dr. Lister, Teacher of Chemistry at Guy's Hospital, kindly suggested to me the trial of the action of Magnesia upon Peruvian Bark. I was farther encouraged to prosecute this subject from the account given by Bergman,

man, in his Essay on Magnesia*, of its promoting the solubility of various resinous bodies in water, although he does not enumerate Bark among the number. Speaking of calcined Magnesia, he adds the following passage: "Cum camphora, " opio, guaiaco, storace, mastice, asafoetida, myrrha, scammonio, aliisque vel " gummoso resinosis, vel pure resinosis, " anatica circiter portione sumtis, in aqua " trititando tincturas exhibet valde com- " mendabiles."

Farther, Mr. Henry, in his experiments on Magnesia, has actually related an experiment, in which he found the solubility of Bark increased by this substance; but it does not appear that this has been attended to, or that he has since that time extended his inquiries.

The experiments with Magnesia, which I am now to relate, have accordingly proved the most interesting in which I have been engaged, and are such, I flatter my-

* Bergman's Opuscula Physica et Chemica, Vol i.

48 *Of common* PERUVIAN BARK.

self, as will be productive of real utility in the practice of medicine.

EXPERIMENT XI.

Two drachms of Peruvian Bark in powder, and half a dram of *calcined Magnesia*, were rubbed together in a mortar, with four ounces of distilled water, for the space of ten or fifteen minutes; the water being gradually added, so as to reduce the materials in the first instance to the state of a paste. The infusion, when passed through filtering paper, was found to be possessed of the following remarkable properties.

1st. An exceedingly deep red colour, superior to the infusion of common Bark in lime water.

2d. It is more bitter and astringent to the taste even than an infusion of red Bark.

3d. It produces a very deep black colour, with a copious precipitation, upon the addition of a solution of *Sal Martis*; while a similar addition to a common infusion

Of common PERUVIAN BARK. 49

fusion of Bark occasions a moderate discolouration and small precipitation only.

4th. It remains beautifully transparent three or four days, and is so strongly antiseptic, that at the end of a week, in summer, it had scarcely made any advances towards fermentation; while an infusion of Bark, with simple water, will ferment in two days.

5th. It exceeds in specific gravity the infusion of Bark in lime water, in the same, or rather in a greater proportion, than that exceeds the simple infusion.

In order to determine more particularly the nature of the infusion prepared by the last experiment, several additions were made to different portions of it. Being mixed in equal quantities with water impregnated with fixed air, no other effect was produced than that of simple dilution. A small quantity of the *acid of sugar*, however, being added to some of the infusion, immediately discharged the red colour, and caused a whitish precipitation; hence it is obvious, that Magnesia not only increases

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the

50 *Of common PERUVIAN BARK.*

the activity of water upon Bark, but is in fact dissolved itself in the water in a very small proportion.

If calcined Magnesia be added to an infusion of Bark, prepared in the common way with simple water, it occasions no change in its colour or properties; from which we may conclude, that when Bark and Magnesia are rubbed together with water, in the manner before mentioned, the Magnesia either enables the water to extract something from the Bark, which it could not have done alone, or, what is more probable, by uniting chemically, they form a compound more active and soluble in water than pure Bark.

With a view of ascertaining how far the colouring matter of an infusion of Bark with Magnesia corresponds with the astringency of it, the following experiment was made.—The clear and colourless liquor was carefully poured off from the precipitate, which the acid of sugar had occasioned when added to the infusion of Bark and Magnesia, and being mixed with a pro-

per quantity of the chalybeate solution, changed into a green colour only; from which circumstance it is probable, that there is a close connexion between the colouring matter and astringency, for the deeper the red colour of the infusion, the more complete always is the black which the chalybeate produces.

Magnesia differs remarkably from Lime in its action upon Bark; for, whether in a small or large quantity, it promotes the solution, though more completely as the proportion is greater. By the addition of half a drachm, or a drachm at the utmost, however, to two drachms of Bark and four ounces of water, the full effects are obtained, and an additional quantity of the Magnesia would only be wasted.

I have mentioned that the Magnesia, with which the experiments hitherto related, was calcined. I may add, that it was prepared by my friend, Mr. Babington, with the greatest care, so as to have lost more than half its weight by calcination. It was next an object to try the action of *common* Magnesia upon Bark, in

52 Of common PERUVIAN BARK.

order to determine how far the presence or absence of fixed air could assist in the explanation of the effects which have been enumerated.

EXPERIMENT XII.

One drachm of common *Magnesia* (which is about equal to half a drachm of the calcined) was rubbed in a mortar fifteen minutes, with two drachms of Bark, and four ounces of pure water, in a similar manner to the infusion with calcined *Magnesia*, and being filtered, was subjected to all the trials which were made with that infusion. Some little difference was perceived in favour of the infusion with calcined *Magnesia*, but the other exhibited similar properties in every respect.

If, indeed, two infusions be prepared, the one with half a drachm of calcined, the other with the same quantity of common *Magnesia*, the former will appear much stronger, the proportion of real *Magnesia* being double; but when allowance is made for

for the presence of fixed air in common Magnesia, all the effects may be obtained from it, nearly, if not in an equal degree, with the calcined.

We are authorized therefore to conclude, that fixed air is by no means concerned in the curious changes which take place during the action of these substances upon one another; nor am I able to explain on what they really depend. Some persons may, perhaps, be disposed to affirm, that the astringency of vegetables is connected with an acid, which combines with the Magnesia, and renders it soluble, having its own solubility increased likewise by the union. Such an explanation is intirely conjectural, and to me quite unsatisfactory. I shall rest satisfied then, at present, with having ascertained some facts, which I trust are applicable to utility; and shall leave the explanation of them to others, or to some future opportunity, when I have leisure to prosecute experiments with Magnesia, and various articles of the Materia Medica.

54 *Of common* PERUVIAN BARK.

It is worth remarking, that neither common, nor calcined Magnesia, when added to Bark and water, and agitated in a vial, or even when boiled together, produce the effects which have been enumerated. The particles of the Magnesia are so light, that they cannot be made to act upon those of the Bark, unless well rubbed in a mortar to the consistence of a paste, previous to the addition of the whole quantity of the water.

Several experiments were instituted, with the view of observing the effects of heat upon the Bark and Magnesia, but did not lead to any material conclusion.—An infusion, in particular, previously prepared by trituration, was boiled for a few minutes, without seeming to have been injured in its properties; though it did not appear, in any of the trials, that heat increased the action of Magnesia upon Bark.

I have hitherto been almost silent on the application which the infusion of Bark with Magnesia admits of to the purposes of medicine, and shall now likewise reserve my
remarks

remarks for another part of the Essay, where the different additions which are made to the Bark are treated of, with an immediate view to practical utility. A better opportunity will occur there of pointing out the advantages of this preparation, and of mentioning its actual exhibition in a variety of diseases by different practitioners, to whom I have communicated my observations.

But we are not to conclude that the Magnesia is in this manner to be rendered subservient to medicine alone. The black colour, which was produced by the chalybeate solution, upon mixing it with the infusion, was so remarkable, that it is probable it may lead to some improvement in the art of *tanning*, in the making of ink, and in some other chemical processes, the consideration of which, being quite unconnected with a treatise on Peruvian Bark, has been purposely omitted at this time.

Should the experiments with Oak Bark, and a variety of other astringents, which it is my intention to prosecute, appear deserving of public inspection, I shall avail

56 *Of common* PERUVIAN BARK.

myself of a convenient and proper channel of communicating them.

The insipid and, apparently, inactive properties of Magnesia, when examined alone, induced me to make trial of the action of some of the other insoluble earthy substances upon Peruvian Bark.

EXPERIMENT XIII.

Two drachms of Bark in powder, and one drachm of prepared chalk, were rubbed together, with four ounces of water, for the space of fifteen minutes; and after being subjected in every respect to the same treatment as the infusion with Magnesia, the clear liquor was carefully examined. The colour of it was exceedingly pale, and the bitterness and astringency so very slight, that there was reason to think the chalk had rather retarded than promoted the action of the water upon the Bark.

EXPERIMENT XIV.

Two drachms of Bark were rubbed, in the same manner as in the last experiment,

with

with about thirty grains of the earth of alum (procured by precipitation from a solution of alum by means of the volatile alkali, and repeatedly washed with warm water) and although the greatest care was taken in adding the four ounces, or ordinary proportion of water, gradually, the infusion, when passed through filtering paper, exhibited appearances exactly similar to those which resulted from the addition of the chalk, the solubility of the Bark seeming to have been manifestly retarded. The effects of Magnesia upon many vegetable substances, constitute a striking difference therefore between it and the *crude calcareous* and *argillaceous* earths.

EXPERIMENT XV.

Two drachms of Bark were added to two ounces of good *Jamaica rum*, and after remaining together nine days, under the same treatment as the tincture, with common proof, and with rectified spirit, mentioned in an early part of this chapter, it was passed

58 Of common PERUVIAN BARK.

ed through filtering paper.—The vial formerly described, when filled with it, weighed six grains more than an equal measure of the spirit by itself.

EXPERIMENT XVI.

Two drachms of Bark, and two ounces of *brandy*, were kept together nine days, at the end of which time the tincture was filtered. The vial, filled with it, weighed full seven grains more than the *menstruum* alone, independent of the marks of strength which were obvious from every other trial; hence I agree with Dr. Percival, that brandy is a powerful solvent of the Bark, but I consider it, notwithstanding, extremely inferior to pure rectified spirit of wine.

EXPERIMENT XVII.

The same quantity of quilled Bark, of the same quality, and reduced to a powder similar to that employed in the foregoing experiments, was added to two ounces of *sound Port wine*, and after repeated agitation,

tion, the mixture was filtered at the end of the ninth day. The increase of weight of the ordinary quantity was only four grains more than the same measure of the wine in its separate state, nor did the tincture possess the common characters of a strong impregnation.

The quantity of astringent matter previously contained in port wine, may assist, perhaps, in explaining why it does not act more powerfully upon the Bark.

EXPERIMENT XVIII.

Two drachms of Bark, and two ounces of *vitriolic æther*, were suffered to remain together, with frequent agitation, nine days. When filtered, it was found scarcely to have acquired any colour, and to be almost intirely destitute both of bitterness and astringency.

EXPERIMENT XIX.

Two drachms of Bark were added to two ounces of *dulcified spirit of sal ammoniac*, and after continuing together the same length

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length of time, and under the same circumstances as the other tinctures, it was passed through filtering paper. Upon examination, it proved to be pretty highly impregnated. The vial filled with it weighed six grains more than an equal measure of the *spirit* itself.

EXPERIMENT XX.

Two drachms of Bark, of the same quality, and of an equally fine powder with that before employed, were added to two ounces of *caustic spirit of sal ammoniac*, and after nine days the tincture was filtered. The volatile alkali in this condition appeared to have acted very strongly upon the Bark. The colour of the tincture was exceedingly deep, and corresponded to the specific gravity, which was, in the ordinary quantity, in the proportion of nine grains more than the spirit from which it was prepared.—It is remarkable too, with what rapidity the caustic spirit acts upon the Bark, for in the course of one day the colour was almost as deep as at any future period.

The

Of common PERUVIAN BARK. 61

The effects of several other additions to the Bark were likewise tried, such as *Mountain wine*, *Rhenish wine*, and *water impregnated with fixed air*, with the following results.

Neither the Mountain nor Rhenish wine, after having undergone the same treatment as the other tinctures, with similar proportions of Bark, exhibited marks of strength superior to the Port wine, which we have already seen is far from being an active *menstruum* for the Bark.—Dr. Percival, in the course of his inquiries into this subject, had reason to conclude that Rhenish wine was preferable to most of the *menstrua* which he tried; hence it is probable, that the proportion of the constituent parts of this kind of wine must vary at different times, otherwise it will be difficult to explain so material a difference in the result of our experiments.—But this uncertainty in the condition of Rhenish wine, is surely sufficient to intitle us to reject it from the number of the useful and proper *menstrua* for Peruvian Bark.

The

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The mixture of Bark, and water impregnated with fixed air, proved still weaker than the two last. The day after they were added to each other, an active state of fermentation was observed, which continued three or four days; and at the end of this time, the clear liquor was examined. It was of a pale colour, and scarcely possessed any of the sensible properties of the Bark. This experiment tends much to illustrate the ingenious observations of Mr. Henry, of Manchester, on Fermentation, which have only been published hitherto in a small pamphlet for the inspection of his friends, but are soon expected to appear in the Transactions of the Philosophical Society of that place. He proposes the addition of fixed air on various occasions, in order to accelerate fermentation, and attempts to demonstrate that *yeast* or *barm*, only operates in consequence of the proportion of this active gas which it contains. Something similar had been hinted at long ago by Juncker, and was farther illustrated by Dr. Lister, in his *Thesis de Fermentatione*,

Fermentations, published at Edinburgh; but Mr. Henry seems to have been the first who has suggested that such a knowledge of ferments should be rendered subservient to utility.

EXPERIMENT XXI.

Two drachms of Bark, and two ounces of proof spirit, were kept together nine days, and the tincture being then poured off, two ounces more of spirit were added to the *residuum* for the same space of time. A similar process was repeated twice again; so that four successive additions of the spirit were at length made to the Bark.—The first and second of these were pretty strongly impregnated, but the former much more so than the latter. The third partook but slightly of the properties of the Bark; and the fourth, or last, was almost tasteless, and without colour.

EXPERIMENT XXII.

To the *residuum* of the last experiment were added four ounces of pure water; and
after

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after boiling them over a slow fire, until near half of the liquor was evaporated, the filtered decoction was found evidently bitter, and became purple when some of the chalybeate solution was mixed with it.

EXPERIMENT XXIII.

Two drachms of Bark, after four triturated cold infusions had been prepared from it, the last of which was almost insipid and colourless, were added to two ounces of proof spirit, and after nine days the tincture was filtered.—It was slightly coloured, and possessed plain characters both of bitterness and astringency.

EXPERIMENT XXIV.

Two drachms of Bark, which had been boiled four different times with water, and the last decoction from which was still more insipid than the fourth cold infusion mentioned in the last experiment, were mixed with two ounces of proof spirit, and after being nine days together, the spirit was
poured

Of common PERUVIAN BARK. 65

poured off. It had scarcely received any colour, or was at least much less tinged than that which had acted upon the *residuum* of the infusions. The marks of bitterness and astringency were likewise less perceptible.

The conclusion, which may be drawn from the four last experiments, is, that neither water nor spirit alone is capable of extracting intirely all the active parts of Bark, but that they both exert such a degree of action upon it, that after successive additions of either of them, the remaining part is much deprived of activity and solubility. Water is probably inadequate to the complete solution of the active parts of this remedy, because the mucilaginous portion of it is not present in a sufficient quantity to render all the resin of the Bark soluble. This is somewhat confirmed by the fact, that a decoction, by no means destitute of the properties of Bark, may be made, by adding a small quantity of gum arabic to some of the cortex, which has been previously boiled so frequently, that

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the

66 *Of common* PERUVIAN BARK.

the last decoction was insipid. And with regard to the spirit, we must conclude that it is incapable of separating the whole of the active parts of Bark, on account of the mucilage keeping united with it a portion of the resinous part; for although spirit attracts the greatest proportion of the resin, and even a little of the mucilage, along with it, as I have formerly endeavoured to prove, it notwithstanding happens, that spirit, having a very slight attraction for mucilage, much of this last must of course remain unacted upon. The superabundant mucilage then will readily attract a small quantity of the resin so strongly, that the spirit is not able intirely to effect a separation.

That the mucilage should attract and keep united with it a small proportion of the resin of Bark, when it cannot do the same with the whole of it, is not at all surprising. Something similar may be frequently observed in chemistry; thus from alum, which consists of argillaceous earth, or pure clay, and vitriolic acid, a large proportion of the latter may be procured
by

Of common PERUVIAN BARK. 67

by exposing the compound to great degrees of heat; but although the heat be intense, and continued for any length of time, the clay still retains in union with it a portion of the acid. In this manner a large proportion of the earth attracts a small one of the acid much more strongly than it does a greater proportion; and thus in the Bark, the smaller the quantity of the resin, the more closely is it united with the mucilage.

The two last experiments tend farther to confirm what was before advanced concerning the superior strength of a decoction of Bark, in comparison with the simple cold infusion; for the spirit evidently extracted more from the *residuum* of the cold infusions than of the decoctions; which is one proof, among several others already mentioned, that the Bark must have yielded more of its active parts to the decoction.

Having tried the action of a variety of substances * upon the Bark, and observed their

* The following Table exhibits, at one view, the relative powers of the different *menstrua* and additions which were made to the quilled Bark.

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their effects, we are now in some degree prepared to determine on the nature of its constituent parts. — It has been proved that water and spirit are both capable of acting with effect upon the cortex, and it is likely

	Grains.
Pure rectified spirit of wine, extracted	14
Caustic spirit of sal ammoniac	9
Brandy	full 7
Rum	6
Dulcified spirit of sal ammoniac	6
Infusion with magnesia (<i>apparently of the most active parts</i>)	5½
Water in decoction	5½
Lime water	4½
Proof spirit	4
Port wine	4
Mountain wine	near 4
Rhenish wine	near 4
Water in the triturated cold infusion	3½
Vitriolic æther	scarcely 2

The remaining additions seemed all rather to retard than increase the solubility of Bark in water.

Water impregnated with fixed air.

Bark and lime rubbed together, and water afterwards added.

Bark with chalk.

— with earth of alum.

In treating of the different preparations of Bark, it will be necessary to advert particularly to this Table.

that

that many of the different *menstrua* operate according as they partake more or less of their properties. Now, if it be considered, that water acts upon mucilage, and not upon resin, except by the intervention of the former; and that spirit, on the contrary, dissolves resin, and scarcely affects mucilage; we are certainly led to conclude, that Bark consists chiefly of mucilaginous and resinous parts. This conclusion has been rather anticipated in a foregoing part of the essay; which is the less to be regretted, as the relation between Bark and the two substances just mentioned has long been understood; but being engaged in a course of experiments on Bark, some degree of repetition was unavoidable.

Any attempt to ascertain the proportion which the resinous parts of Bark bear to the mucilaginous, is attended with so much difficulty, that I have avoided any inquiry on the subject, more especially on account of the great difference which arises from the quality of the Bark, all those who have hitherto endeavoured to determine

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70 *Of common PERUVIAN BARK.*

mine the point, having differed extremely in their accounts.

Newman says, that he obtained from one pound of Bark, *ten drachms and two scruples* of resinous, and afterwards, with water, *five drachms* of gummy extract; but that, on applying water at first, he obtained *seven drachms and one scruple* of gummy, and afterwards, by spirit, *six drachms* of resinous extract*.

Dr. Lewis, in his note upon this passage, observes, that different sorts of Peruvian Bark differ considerably in their yield of extract, for that those which he examined, afforded a much larger quantity of resinous extract than Newman had obtained.

If I may be allowed to calculate from my experiment with the rectified spirit of wine, the conclusion would be, that each ounce of good quilled Bark is capable of yielding, at least, *one drachm and a scruple* of resinous, independent of the watery or

* Newman's Chemical Works, 4to, p. 339.

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gummy extract; unless the heat employed in the evaporation of the spirit be so violent as to dissipate some of the resinous particles. That this may happen, is not improbable, from the consideration, that if a decoction of Bark be hastily prepared, over a strong fire, a number of these particles, finely divided, collect, in general, upon the surface of the liquor, in form of an oily kind of pellicle or covering; a circumstance which I have formerly noticed, in speaking of the distillations of Bark, and which requires particular attention. With respect to the proportion of mucilaginous parts, I have already mentioned that it is not sufficient to render all the resin soluble in watery liquors: hence it is unnecessary to dwell farther on the subject.

It may not be improper, in the next place, to inquire in what part of the Bark the properties of bitterness and astringency reside.—Dr. Lewis's opinion is very different from that which I am disposed to adopt. “ It is observable of this drug

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“(says he) that its astringency resides
“wholly in its resin, which does not ap-
“pear to be in any degree soluble in wa-
“tery liquors; but its bitterness, in a
“gummy resinous substance, or such an
“one as is dissoluble both in water and
“in spirit. Both principles may be ex-
“tracted by boiling in water, the resin
“melting out by the heat, and rendering
“the liquor turbid. The decoction in
“this state tastes astringent as well as bit-
“ter; but on standing, it deposits the resin
“and becomes clear, and then proves simply
“bitter. Repeated coction and large quan-
“tities of water are necessary for extract-
“ing all the virtues of the Bark. The
“resin melts out in the first boilings, and
“the decoctions made afterwards are trans-
“parent and bitter, without the least tur-
“bidity or astringency*.”

As it has been proved in the eighth ex-
periment, that the decoction of Bark pos-
sessed striking characters of astringency,

• Lewis's Materia Medica.

and

and as the experiment was made upon a quantity of it passed through filtering paper, we may fairly conclude that the astringent property was actually united with the water. If this be the case, Dr. Lewis must have been led into an error, in supposing that the resin could only be suspended or diffused through it.

The latter part of his conclusion differs too from that which I should be inclined to form; for the Bark in my experiments, after being boiled twice in water, proved capable, on a third trial, of imparting some degree of astringency, as well as bitterness; whereas he observes, that on such occasions the liquor was destitute of astringency.

I cannot help believing, that the bitterness and astringency of Bark both reside in its resin, or are nearly connected with it; and that the mucilage or gummy part is of a similar nature with that of gum arabic, and many other vegetable mucilages, but so intimately combined with the resinous part, that it is difficult to separate them
from

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from each other.—It is an undoubted truth, however, that rectified spirit extracts *resin chiefly*, and yet we find the spirit partaking strongly both of bitterness and astringency. Farther, the resin, precipitated from such a tincture, which we cannot but suppose still more divested of the gummy part, is not only astringent, but highly bitter. To determine which more certainly, the following experiment was made.

EXPERIMENT XXV.

Three ounces of the tincture of Bark, partly prepared with proof, and partly with rectified spirit, were added to six ounces of water, and when the resin had sufficiently subsided, the clear liquor was poured off. Successive quantities of water were then employed in a similar manner, till they ceased to dissolve any portion whatever of the Bark, being thoroughly void of taste as well as colour.—The pure resin was now mixed with about twenty grains of gum arabic, and having added four ounces

ounces of water, they were boiled for a short time over a slow fire. When the mixture had cooled sufficiently, I examined it, and found that by means of the mucilage the greatest part of the resinous precipitate had been dissolved. The liquor was high-coloured, exceedingly bitter, and, upon the addition of the chalybeate, it assumed a dark colour, and became very turbid.

This experiment, then, in addition to what has been said before, makes it probable, that the properties both of astringency and bitterness reside in the resin of the Bark, and consequently, as far as we are capable of judging, all the active parts of it.

By separating the gummy from the resinous part, therefore, as in the last experiment, and then adding gum arabic, the virtues of it are nearly as entire as if its own mucilage or gummy part had been preserved.

The following passage from Newman,
if

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if a farther confirmation of my conclusion be necessary, will be highly conducive to the purpose. “ The extract (says he) “ made from Bark, by applying water at “ first, tastes considerably bitter and astringent, but not near so much so as that made “ by spirit *.” The reason is obvious, viz. that the spirit extracts a much greater proportion of the resinous part, the water only dissolving it through the assistance of the mucilage.

Having now finished all the remarks which I proposed to offer on the quilled Bark, as that has been employed in all my experiments, I shall in the next place attempt a short comparison between it and the flat pieces of Bark.

It was observed before, that many practitioners have been disposed to give the preference to the quilled. With what reason, the following experiments will assist us in determining.

* Newman's Chemistry, 4to, p. 339.

EXPERI-

EXPERIMENT XXVI.

Two drachms of small flat Bark, reduced to a tolerably fine powder, and procured from the same druggist, at the same price as the quilled, were added to two ounces of proof spirit, and after a treatment exactly similar to the tincture of quilled in the same *menstruum*, the liquor was passed through filtering paper. The colour was much deeper, and the vial formerly mentioned, when filled with it, weighed five grains more than an equal measure of the spirit from which it was made, and one grain more, of course, than the tincture of quilled Bark.

EXPERIMENT XXVII.

An infusion was prepared with the same kind of Bark as was employed in the last experiment, in the same proportion, and under similar treatment as the triturated infusion of quilled (Experiment V.)

The

78 *Of common* PERUVIAN BARK.

The difference in colour was not so remarkable as in the tinctures, nor did the specific gravities distinctly vary. The infusion of the flat Bark however appeared, both from the taste, and from the appearances upon the addition of the chalybeate, to be equally strong, if not rather more so, than the other.

EXPERIMENT XXVIII.

A decoction of the flat Bark also was made, after the manner of Experiment VI. and compared with the decoction of quilled, but the difference was not more remarkable than in the infusions.

From these few experiments, and likewise from having seen the flat Peruvian Bark used frequently, as well as the quilled, I am disposed to conclude, that the preference which is given by many to the latter, is without foundation; and that the flat pieces, if they be firm and compact, of a reddish colour, and sufficiently

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ciently bitter and astringent to the taste, are just as good, if not preferable, on many occasions, to the quilled Bark.

I have occasionally seen very excellent specimens of Peruvian Bark, which were almost intirely black on the external surface, but internally of a slight reddish colour.

The article, in short, differs so much in its appearance at different times, that an attention to the degree of bitterness and astringency, discoverable to the taste, should never be neglected, as it will afford great assistance in determining the comparative goodness of any two parcels that may be presented for examination.

C H A P. III.

A Consideration of the sensible Effects of quilled, and of common Peruvian Bark, in general, on the Body.

THESE are much varied, according to the constitutions of different persons, independent of the variety which arises from accidental circumstances; they are much affected also by the dose, mode of exhibition, and often likewise by the additions which are made to it, but this last is a distinct consideration. It is necessary at present to speak only of the article in its separate state.

The sensible effects of Bark on the healthy body must be liable, with numerous other remedies, to vary in different individuals, particularly with regard to the pulse, which is easily altered, within certain limits, by a thousand insignificant occurrences. I have been induced, on this account,

account, to omit the trial of its action on my own body, as a single instance could have afforded nothing satisfactory on the subject; and the exhibition of a remedy to a number of persons (the operation of which is slow) is attended with such inconvenience, that no information which could have been expected, would have compensated for the time and trouble bestowed on this method of inquiry. The observations, then, which I shall offer, have been collected from an attention to the operation of the remedy under a state of indisposition, more or less severe.

It is well known, that the Bark sometimes occasions costiveness, sometimes troublesome diarrhoea; and in other cases, it produces moderate and regular stools; hence its action on the intestines is to be considered uncertain. When the doses are large, or frequently repeated, it is liable to disagree with the stomach, giving rise to a sense of weight and oppression about the *epigastric region*, sometimes followed by nausea and vomiting.

G

Its

82 *Of common* PERUVIAN BARK.

Its operation is, in general, so gradual, that scarcely any sensible effects can be observed on the pulse, though some have affirmed that it is rendered harder and quicker by it. Most persons agree, that under its continued use, the action of the arteries becomes fuller and stronger, but that the excitement of the body, or increased impetus of circulation, is at the same time so slight, as readily to distinguish it from a number of common and simple stimulants; and hence has arisen the idea of its tonic properties.—Now and then, in well-marked inflammatory cases more particularly, it increases head-ach, produces flushing of the face and difficult respiration, with heat of the skin and general anxiety; but it may be a question whether these depend upon any inherent stimulant quality in the Bark, or whether they may not be more justly attributed to the difficulty or struggle, which is excited in the system from a quantity of insoluble matter in the stomach, not capable of being subdued

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duced by the gastric fluid, in its altered, diminished, or diseased condition.

In fevers attended with debility, and those especially which shew a tendency to remission, the effects of Bark (provided the stomach be not overloaded with it) are in general the reverse of those just mentioned. In these it diminishes febrile heat, renders the pulse stronger, and at the same time makes it less frequent.

The form of cold infusion, or decoction, is, for the most part, more acceptable to the stomach than any other mode of exhibition, not only increasing the appetite, but promoting digestion. The Bark almost invariably, when judiciously administered, and retained in the body, restores the strength, and is said to mend the spirits, which last is rather, perhaps, the consequence of its former operation. It restrains colliquative sweats and other morbid evacuations, but does not appear to diminish the *torbida* or any of the natural and healthy discharges.

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Certain ill effects have been attributed to this remedy at different times, but it must be pretty obvious that most of these have originated either from superficial or mistaken observation. Even the deafness, which Morton allows he had experienced from it, may be referred more to the supposed than real operation of Bark, as this complaint is a frequent symptom of fevers and other diseases, and of such a nature, that it is extremely difficult to conceive how any remedy whatever, taken into the stomach, should produce such an effect.

Some few have ascribed a *narcotic power* to Bark; but such an opinion seems intirely void of foundation. Morton, after speaking of one author, who believed that this was the case, adds, "*Quis enim præter illum* "*usquam, vel somniando, corticem in* "*classe narcoticorum posuit*?*" It is certain, that others have, since his time, endeavoured to maintain a similar opinion, though the number has been so small, and

M O * Morton, Opera Med. Amstel. p. 73.

the assertion so little favoured by men of experience and observation, that it would be time mispent to bestow much consideration on it, or attempt its serious refutation.

Even the mistaken observation which Morton shows to have been experienced from it, may be referred more to the sup- posed than real operation of Bark, as this complaint is a frequent symptom of fevers, and other diseases, and of such a nature, that it is extremely difficult to conceive how any remedy whatever, taken into the stomach, should produce such an effect. Some few have observed a narcotic power to Bark, but such an opinion seems entirely void of foundation. Morton, after speaking of one author, who believed that this was the case, adds, "Quis enim præter illam 'aldum, vel tommando, corticem in classe narcoticorum ponit?' It is cer- tain, that others have, since his time, en- deavoured to maintain a similar opinion, though the number has been so small, and

SECTION II.

OF RED PERUVIAN BARK.

C H A P. I.

An Inquiry into the Nature and Properties of red Bark, its sensible Qualities, Analysis, and its sensible Effects on the Body; including a Comparison between it and the quilled Bark.

ALTHOUGH a red species of Bark has been generally mentioned by writers on the subject, yet practitioners, in England and many other countries, having been long accustomed to employ a different kind, the introduction of it into practice has appeared a considerable novelty.

ty. Notwithstanding the strong recommendation which Dr. Saunders has given of it, for three or four years past, in several successive editions of his Treatise on the superior efficacy of Red Peruvian Bark, where numerous other authorities are likewise collected in its favour, there is reason to think that the use of it did not so soon become general, as might have been expected. We shall not be much surpris'd at this circumstance, when it is remembered, that most of the material improvements which have been made in medicine, have in the beginning always struggled with powerful opponents. A similar kind of distrust and opposition must for ever continue to operate, while interested motives or want of candour on the one hand, or negligence and indifference on the other, are observed to exert their pernicious influence on the actions of mankind.—Most of those, however, who at first refused their assent to this powerful remedy, have at length been reduced to the necessity of acknowledging its efficacy, and regretting

that the scarcity and high price of it are the only obstacles to its more frequent employment. The objections which have been made, by the few who resist all conviction, shall be fully considered hereafter, as this is not the proper place for such a discussion.

Dr. Saunders has written so fully on the red Bark, that it would be difficult to give an account of it, without confessing myself indebted to many of his observations, and either making extracts from, or referring occasionally to his treatise. I mean to adopt the one or the other method, as shall appear most convenient; but will endeavour, both from experiments, and from the various inquiries which I have made at different times, concerning this kind of Bark, to introduce some additional observations.

It was in consequence of the capture of a Spanish ship from Lima bound to Cadiz, that the red Bark was imported into England; and there is some reason to think, that the cargo of the same vessel has supported the

the numerous demands for this article, not only at home, but from many places abroad, till within the last few months. The original supply seems now to be so nearly exhausted, that many have been obliged, with much regret, to lay it aside for the present, the small remaining quantity, when genuine, bearing the most extravagant price. Even in its indifferent or counterfeited state, it is sold for a sum much beyond the best selected and most efficacious quilled Bark.

The high value of red Bark in England, will certainly operate as a very powerful inducement to persons in trade to procure it, so that there is every reason to expect, ere long, that we shall be supplied with it at a rate sufficiently easy to authorize a general exhibition of it, in all obstinate or dangerous diseases where Bark is indicated. I was informed lately, by a druggist in an extensive line of business, that accounts which could be depended on, had been received here, of the arrival of a large quantity of red Bark at Spain, and that it had
been

been offered to some of our merchants; but that the price, which was about ten shillings per pound, appeared too high to admit of any tolerable profit when brought hither. It is much to be wished, that the demand of the Spaniards may be so far diminished, before this time, as to have given our people an opportunity of forming a satisfactory agreement with them.

Dr. Saunders, in treating of the sensible qualities of red Bark, observes, that it is in much larger and thicker pieces than the common Peruvian Bark; that it evidently consists of three distinct layers:—the external, thin, rugged, and frequently covered with a mossy substance, and of a reddish brown colour:—the middle, thicker, more compact, and of a darker colour, being exceedingly resinous:—the innermost, of a more woody and fibrous appearance, and of a brighter red than the former. He adds also, that he has seen some very good red Bark, whose external coat had a white appearance, though its internal surface was

of a deep red colour, extremely resinous, compact, and heavy*.

Having seen great quantities of the red Bark, I am well convinced that the above is an accurate description of the best kind of it; but it does not appear to comprehend the great variety of conditions, under which it has been met with in the shops of different druggists, which, although in many instances of an inferior quality, seems notwithstanding to have been the same kind of Bark, possessing very powerful sensible qualities.

In some of the chests of red Bark, I have been informed by a gentleman conversant with the article, that there were scarcely twenty large pieces to be found; whereas, in others, six pounds of small could not be picked from the whole.

It is sometimes of a deep red colour, at other times of a bright red with a greyish coloured rind. In general, the thinner the pieces, the greater is the proportion of

* Saunders on the superior efficacy of red Peruvian Bark, p. 17, &c.

resin with which they abound. I have several specimens in my possession which almost intirely consist of resinous matter; but it is not easy to select any quantity of it in so perfect a condition, the innermost fibrous layer commonly bearing a great proportion to the others. It may be proper to mention, that some of the paler, spongy, and more woody pieces of the common Bark, may be frequently found intermixed with the red Bark. Whenever we wish to chuse a parcel, therefore, it must be obvious that these should be separated, and those likewise which, although red, are short, thick, and woody, not having any appearance of distinct layers or lamina. Farther, I have seen some pieces of this new kind of Bark, in which the resinous layer and external coat were exactly similar to other quantities of it, and yet the internal layer or more woody part was scarcely red, so that when reduced to powder, it did not differ much in its appearance from common Bark; but its strong bitter and astringent taste, with the proportion

portion of resin in it, proved it to be very superior, and to be of the same nature as the red Bark. Hence the diminution of the red colour alone is by no means a proof of its want of efficacy. There is reason indeed to think, that by long exposure to the light, the most perfect red Bark may be deprived of its colour, and still retain its useful properties intire. This, I have been told by good authority, has actually happened to a quantity which had been kept exposed for a long time in the window of an apothecary's shop.—On the other hand, Bark may be red on some occasions, as already hinted, without being genuine. I have been well convinced of the truth of this, from the examination, in several instances, of red Bark in powder, having the colour exceedingly complete, but being almost destitute of bitterness and astringency. This being the case, should not physicians, when they prescribe red Bark in urgent diseases, examine it by the taste, in order to be satisfied whether it be genuine or otherwise?

With

With regard to the taste of the red Bark, it is evidently more bitter and astringent than the quilled or common Peruvian Bark, and in precipitation with chalybeate solutions exhibits greater marks of astringency likewise.

On the subject of aroma, I have been directed by trials similar to those performed on the quilled Bark. These will determine how far such a property can be ascribed to it.

EXPERIMENT XXIX.

Four drachms of red Bark, well bruised, were added to eight ounces of water in a distilling glass apparatus, and treated in the same manner as the quilled Bark in the first experiment; with a similar result, as the liquor that passed over into the receiver had scarcely any flavour; less, if possible, even than that obtained from the quilled Bark.

EXPERIMENT XXX.

Half an ounce of red Bark, and eight ounces of proof spirit, placed in a proper distilling apparatus, were treated as the quilled Bark in the second experiment; with exactly the same result; for in the liquor collected in the receiver, none of the properties of the Bark whatever could be perceived.

From these experiments, we may infer, that the red Bark agrees with the quilled, in containing no aroma nor essential oil.

EXPERIMENT XXXI.

Two drachms of red Bark were added to two ounces of *proof spirit*, and after remaining together nine days, as in the third experiment with quilled Bark, the tincture was filtered. It was of a much deeper colour than the tincture of quilled Bark, and the vial, employed in all the former experiments, being filled with it, weighed six

grains more than the same vial containing some of the spirit from which it was prepared, and consequently two grains more than the tincture of Experiment III.

EXPERIMENT XXXII.

Two drachms of red Bark, with two ounces of rectified spirit of wine, were treated in the same manner as the quilled Bark in the fourth experiment. This tincture, when filtered, was of an exceeding deep colour (resembling almost, in appearance, the *bals. traumat.* of the shops) and the vial being filled with it weighed eighteen grains more than an equal measure of the spirit alone, which is only four grains more than the tincture of quilled Bark in the same *menstruum*, although, from the difference in the colour, there was reason to expect that the specific gravity of the tincture of red Bark would have proved much greater.

EXPERIMENT XXXIII.

An infusion of red Bark was prepared by rubbing it with water, in similar proportions and circumstances with the cold infusion of quilled Bark. The former was of a reddish colour, and considerably more bitter than the other. In the vial filled with it, was observed an increase of five grains and a half in weight, which is two grains more than the same measure of the infusion of quilled Bark. With the infusion of red too, the chalybeate produced a more copious and dark-coloured precipitate than in the other infusion.

EXPERIMENT XXXIV.

A decoction of the red Bark, prepared after the manner, and with the same proportions as the decoction of pale Bark, when passed through filtering paper, was found to be of a much deeper colour, and vastly more bitter than that decoction.

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98 *Of red* PERUVIAN BARK.

The vial filled with it weighed full seven grains more than an equal measure of the water from which it was made, and near two grains more than the decoction of quilled Bark. On the addition of the chalybeate, likewise, it became exceedingly turbid, and let fall a great quantity of a dark-coloured precipitate.

EXPERIMENT XXXV.

An infusion of red Bark in *lime-water* was prepared under circumstances similar to the infusion of quilled Bark in the same *menstruum*, and exhibited no small degree of strength. The colour, however, was not much deeper than the other, and the specific gravity but little different, for the vial being filled with it, weighed only five grains more than the same measure of the lime-water alone.

EXPERIMENT XXXVI.

A tea-spoonful of the tincture of red Bark in proof spirit (Experiment XXXI.)
was

Of red PERUVIAN BARK. 99

was added to one ounce of spring water. The mixture immediately became turbid, and deposited a more copious precipitate than the tincture of quilled, in the same *menstruum*.

EXPERIMENT XXXVII.

A similar trial was made with the tincture of red Bark in rectified spirit (Experiment XXXII.) and the precipitate was much more copious than in the last experiment, and superior also to the tincture of quilled in rectified spirit, treated in the same manner.

EXPERIMENT XXXVIII.

Two drachms of red Bark were added to two ounces of *Jamaica rum*, and after remaining together nine days, the vial being frequently agitated, as in all the former tinctures, the liquor was passed through filtering paper. It was of a very deep colour, and the vial, when filled with

100 *Of red* PERUVIAN BARK.

it, weighed ten grains more than its *menstruum*, and four grains more, consequently, than the tincture of quilled Bark in rum.

EXPERIMENT XXXIX.

A tincture of red Bark was prepared with *brandy*, under similar circumstances, and with the same proportions as the last. This, when filtered, proved a very strong tincture from its colour and taste, though the vial filled with it was scarcely of greater specific gravity than the tincture in rum. It weighed three grains more, however, than the tincture of quilled Bark in the same *menstruum*.

EXPERIMENT XL.

Two drachms of red Bark were added to two ounces of *Port wine*, and after being treated in a similar way with all the foregoing tinctures, the filtered liquor was examined. It was remarkable, that in this instance the red Bark had added but little

to

to the colour of the wine, and the usual measure weighed only five grains more than the Port alone.

EXPERIMENT XLI.

Two drachms of red Bark in powder, were added to two ounces of vitriolic æther, and, after being subjected to the same treatment as the quilled Bark had undergone in the same fluid, the clear liquor was examined with a similar result; for, although it had acquired a deeper colour, it was notwithstanding but slightly impregnated, as appeared from the weight and other trials. The vial filled with it, weighed only three grains more than the same measure of the æther by itself.

The effects of the *caustic spirit*, and of the *dulcified spirit of sal ammoniac*, likewise were tried with the red Bark, after the manner of the quilled Bark, in the same *menstrua*, and with similar results. They both acted powerfully on it in a very short space of time. The vial filled with the

former weighed twelve grains, and the latter eight grains, more than equal measures of the spirits in their separate condition.

Some experiments were next instituted with *Magnesia* and red Bark, and conducted according to the method fully described in treating of the action of this earthy substance upon common Peruvian Bark, but with a very different result.—It is remarkable, that in the trials with red Bark, no effects could be perceived, either from common or calcined *magnesia*. The colour of an infusion prepared in this way (i. e. by rubbing two drachms of red Bark and half a drachm of *Magnesia* together, for fifteen minutes, with four ounces of water added in a gradual manner) is not deeper than an infusion in simple water. If, however, the *Magnesia* and red Bark be kept infused a few hours after being well rubbed, the liquor at length acquires a pretty deep red colour, but is not more bitter to the taste than the plain infusion of red Bark in water.

This

This difference, in the action of Magnesia upon the common and red Bark, seems to point out a difference in the nature of their constituent parts, which the other experiments were not capable of detecting. As all the substances which had acted upon quilled Bark, appeared to exert a more powerful action on the red, there was every reason to expect that the effects in the present instance should be similar. I confess myself rather at a loss for a satisfactory explanation of the difference, unless we suppose that the soluble parts of the red Bark are already in such a state of activity, as not to admit of any improvement from Magnesia; while, on the other hand, red Bark is most successfully imitated by uniting Magnesia and common Bark.

EXPERIMENT XLII.

Two drachms of red Bark were treated in the same manner as had formerly been done with the quilled, by making four

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successive

104 *Of red* PERUVIAN BARK.

successive tinctures from it, by means of proof spirit. All of them were found to be impregnated with the red in a degree far superior to the tinctures of quilled Bark. The fourth tincture of red Bark evidently exhibited marks of greater strength than the third of the quilled.

EXPERIMENT XLIII.

The residuum of the Bark, employed in the last experiment, was boiled in four ounces of spring water, over a slow fire, till about one half was consumed. The filtered liquor was of a reddish colour, and more bitter to the taste than the decoction of quilled Bark, prepared in the same manner. On the addition of the chalybeate, likewise, the mixture was changed to a much darker colour.

EXPERIMENT XLIV.

Two drachms of red Bark, after four triturated cold infusions had been made
from

Of red PERUVIAN BARK. 105

from it, were added to two ounces of proof spirit, and at the end of nine days the tincture was filtered. It was of a reddish colour, moderately bitter, and gave the common marks of astringency in a greater degree than the quilled Bark under similar circumstances.

EXPERIMENT XLV.

A tincture was also made with the residuum of two drachms of red Bark, after four decoctions had been prepared from it. The colour was not so high as the tincture of the last experiment, nor did it possess so much bitterness and astringency, though in every respect superior to the preparation of quilled Bark, treated in a similar way.

EXPERIMENT XLVI.

Several ounces of the tincture of red Bark were added to water, in the proportion, and according to the method employed

ployed with the quilled Bark; by which means the resinous precipitate of red Bark was obtained pure. This was afterwards united with water, by means of gum arabic; the result of which union being similar to that of the resin of quilled Bark with the same substances, and the inference which may be drawn from it being the same likewise, it is unnecessary to enlarge farther on the subject in this place.

The only remaining experiments that I have made on the red Bark, are such as relate to the length of time, which infusions and decoctions of it will remain sound. I have frequently compared these with infusions and decoctions of the quilled Bark, and have constantly found, that these last run into a state of fermentation in two, three, or four days, according to the heat of the weather; while the preparations of red Bark, for the most part, remain intire as many weeks.

Dr. Saunders, in his Treatise on red Peruvian Bark, has mentioned, that, at his desire, I had conducted some experiments

on

on animal matter, and different infusions and decoctions of the red and quilled Bark, with the view of ascertaining their comparative antiseptic powers; and that every trial of this kind had terminated in favour of the red Bark. Dr. Kentish, in a pamphlet lately published on the St. Lucia Bark, has thought proper to doubt my accuracy in these experiments, and endeavours, from two or three only of his own, to establish a conclusion diametrically opposite. Now, as my experiments were not only subjected to the examination of Dr. Saunders, but to a number of gentlemen who attended the hospital at the time; as they were more numerous, likewise, than those which Dr. Kentish has related; and as he has expressly acknowledged, that he made no trials with the decoctions of the different kinds of Bark; I may surely be permitted, in turn, to doubt his accuracy. I trust it will hereafter appear, that most of the other circumstances which he has mentioned, to the prejudice of the red Bark, have been too hastily adopted,
and

and are equally unsupported by the observations of every other person, who has been engaged in similar inquiries.

The great variety in the quality of red Bark, some parcels containing twice the quantity of resin which is met with in others, has prevented me from any attempt of calculating the proportion which the resinous bear to the other parts of it. It is obvious from the experiments of Dr. Saunders, and of other persons, however, that the red Bark contains a much greater proportion of resin than the best kind of quilled Bark. In some experiments which have been made upon the former, it has yielded near one half of spirituous extract; in others, one third, and so on, according to its quality.

The conclusions which may be drawn from the preceding experiments, are the following:

1st. That the red Bark resembles the quilled in its sensible properties, both possessing bitterness and astringency; but that these qualities are found in a far more remarkable

markable degree in the former than in the latter.

2d. That, by chemical trials, the red and quilled Barks appear in many respects similar, most of the substances which act on the one likewise acting on the other; with this difference, that the red Bark imparts a greater proportion of active and resinous parts. But,

3d. That as Magnesia does not produce the same remarkable effect on red as on the common Bark, there must be some difference in the real nature of the constituent parts, arising probably from the previous union of some unknown body with the resin of the red Bark, by which it is rendered extremely active and soluble, and the desired action of Magnesia upon it thoroughly excluded, in consequence of a superiority of attraction.

4th. That the preparations of red Bark are of a more antiseptic, or less fermentable nature, than those of the common or quilled Bark*.

* The following Table will exhibit the comparative
action

110 *Of red* PERUVIAN BARK.

The sensible effects of red Bark on the human body are liable to considerable variation, in the same manner as the quilled. They are altered by the constitution, dose, method of exhibition, and by many accidental circumstances. When it is given in substance, to the quantity of a scruple, or half a drachm, not oftener than three or four times a day, it produces no sensible effects that are very remarkable. With some, a moderate purgative effect is observed from it, while in others it occasions action of the different substances, which were added to the quilled and red Peruvian Bark.

QUILLED BARK.		RED BARK.	
	Gr.		Gr.
Rectified Spirit of Wine	14	Rectified Spirit of Wine	18
Caustic Spirit of Sal Ammoniac	9	Caustic Spirit of Sal Ammoniac	12
Brandy	full 7	Brandy	full 10
Dulcified Spirit of Sal Ammoniac	6	Dulcified Spirit of Sal Ammoniac	8
Rum	6	Rum	10
Infusion with Magnesia	5½	With Magnesia and Water, no additional Effect.	
Water in Decoction	5½	Water in Decoction	full 7
Lime Water	4½	Lime Water	5
Proof Spirit	4	Proof Spirit	6
Port Wine	4	Port Wine	5
Water, in the triturated cold Infusion	3½	Water, in the triturated cold Infusion	5½
Vitriolic Æther	3	Vitriolic Æther	3

slight

slight costiveness. In larger doses, and more frequently repeated, the red Bark most commonly excites purging; but this effect will often cease after a day or two, although the use of it be persevered in. It appears to me, likewise, that a large dose of this kind of Bark is more liable to disagree with the stomach, and to produce nausea, vomiting, and a sense of weight in the organ, than the pale or quilled Bark. This, however, is denied by several persons, who affirm, that the red Bark is more agreeable to the stomach than any other species of it.

To add more, concerning those sensible effects of the red Bark, which are well ascertained, and generally acknowledged to belong to it, would be a repetition of the observations on the sensible effects of quilled and common Peruvian Bark; for, as far as I can perceive, they are exceedingly similar, only that the red produces all of them in a greater degree.

From the first introduction of red Bark to the present time, objections have been
started

started to its use. Some feared inconveniences from its powerful astringent qualities, and others condemned it on account of the strong bitter and disagreeable taste; in doing which they all admitted it to be a medicine of much power and activity. But it would have been well had they proved the injurious tendency of its astringency from actual experience. I believe it has been far otherwise, and that the opinion has originated from the idea, that because common Peruvian Bark has been said occasionally to do harm, in stopping perspiration, expectoration, &c. the red Bark, being more astringent, must consequently be more liable to give rise to such an effect. This objection, then, to the red Bark, not having been drawn as an inference from its real sensible effects on the body, but being supported by theory, and by its *sensible qualities* chiefly, we are at full liberty to reject it.

What shall we say to some other marks of disapprobation which have been urged against this useful remedy, when they are found

found unsupported either by theory or experience, having derived their origin entirely from ill-directed observation, and from the unfortunate, but too frequent error of confounding the effects of remedies with accidental symptoms? It is often difficult to determine whether certain appearances in the animal œconomy should be referred to a medicine previously administered, to the regular progress of disease, or some accidental circumstance. On every occasion, therefore, it is manifestly proper that we should be cautious in our decision; which is a rule that has been little regarded by those who have asserted, that in fevers the red Bark was liable to produce delirium, whereas the common Bark could be given with safety. This, and some other extraordinary effects which have been ascribed to this remedy, have occurred in so few instances, that every man who reflects on them with impartiality, will be readily disposed to attribute them to the progress of the disorder, or some accidental occurrence, rather than

the real operation or sensible effects of the red Bark.

CHAP. II.

Examination of the Proofs of the superior Efficacy of the Red Bark.

THE remarks which have been made on the sensible qualities of the red and quilled Bark, on the action of different *menstrua* upon them, and on their sensible effects on the human body, forming a comparison between them, would certainly lead us to pronounce, that the red possessed superior powers, and would cure diseases more completely. That it is really endowed with greater efficacy has been proved, I think, by the extensive experience of many practitioners, who have employed it with the greatest success in the cure of some of the most alarming diseases, to which the human body is liable; for it has been by no means confined to the treatment

ment of intermittent fevers, although they have afforded the most remarkable proof of its superior efficacy.

In treating of this subject, it is necessary to insist on the very ample testimony of Dr. Saunders, in his Treatise on red Bark, where the most favourable accounts are given of it; not only from his own experience, but from the observations of many other practitioners.

Before the introduction of the red Bark, I had been accustomed, at Guy's Hospital, to observe intermittents obstinately resisting all the attempts which were made towards their removal; but after happily becoming acquainted with this remedy, scarcely an instance of this kind occurred to my notice.

The use of the red Bark too having lately been omitted at that hospital, on account of its scarcity and high price, a difference can clearly be perceived, not only in intermittents, but in most of the disorders for which Bark is prescribed; the recoveries are often slower and more imperfect; and

the infusions and decoctions of common Bark, more especially, will admit of no degree of comparison with the same preparations of the red Bark.

Among the authorities in favour of this species of Bark, may be mentioned, with much propriety, Mr. Rigby, an ingenious surgeon at Norwich, who has published a treatise, in order to confirm Dr. Saunders's account, and give additional weight to his observations. He has selected a great number of the most obstinate cases of intermittents, in which he administered the red Bark with uncommon success; and gives the following remarkable passage, in support of its superior powers: " From
 " that time to the present, I have confidently given it in every case which has
 " been under my care; and its use has been
 " invariably attended with the same immediate success: and though I have administered it in every species of the intermittent, and have given it to patients
 " under the greatest variety of circumstances, respecting age, constitution, date
 " of

“ of the disease, &c. and more than two
“ hundred and fifty persons have taken it
“ under my direction, yet it has not failed
“ in a single case to stop the return of the
“ paroxysm in the first instance of its ap-
“ plication*.”

I have been so well convinced, for a long time past, of the excellent qualities of red Bark, and of the preference which is due to it, that I have not hesitated to recommend it strongly to such of my medical friends, both in this country and the West Indies, as appeared to be unacquainted with it. Several of these, after a full trial of it, have received the greatest satisfaction, and have favoured me with the result of their observations.

It may not be improper to insert in this place, an extract from a letter written by my friend Dr. Farre, of Barbadoes; to whom I am indebted for many advantages, during the early part of my medical education.—“ The red Bark (he observes) has

* Rigby's Essay on the red Peruvian Bark, p. 35.

“ become quite a shop medicine with me.
 “ I have used it very freely, and with the
 “ greatest success; and, in some particular
 “ and obstinate cases, in very large doses,
 “ i. e. from one drachm to four scruples,
 “ in substance, every second or third hour,
 “ without observing any unfavourable
 “ symptom or ill effect from it. On the
 “ contrary, it sits easier on the stomach
 “ in general, and is much more to be de-
 “ pended on in remission of fever, than the
 “ Peruvian Bark in common use. The
 “ effects and success of it were very re-
 “ markable in a case of considerable *morti-*
 “ *fication*, which attended the late epi-
 “ demic fever. My usual dose is from
 “ half a drachm to two scruples in sub-
 “ stance; but I have found that a tincture,
 “ made after the manner of Huxham’s,
 “ with good old brandy, is a most excel-
 “ lent medicine, particularly when exhi-
 “ bited with *Elix. Vitriol. dulc.* at a time
 “ when the stomach cannot retain it in
 “ any other form.”

After describing a dangerous epide-
 mic fever, which had occurred a short
 time

time before in the island, he adds the following passage, likewise, in favour of the red Bark. — “ In general, my “ patients got much quicker through the “ disease, under a course of the *red*, than “ the common Peruvian Bark; and I had “ very little trouble in the convalescent “ state, which I attribute solely to its “ amazing tonic powers.”

The accounts from Grenada, and several other islands in the West Indies, are to the same purpose. Many of the practitioners in those countries have expressed the greatest desire, to their correspondents in London, of being regularly supplied with it, and will, no doubt, sincerely regret the present scarcity of it.

Dr. Saunders, having received a letter some time ago from a gentleman in Germany, who had not long before left London, has kindly favoured me with some extracts from it, which may not be unacceptable to my readers.—He observes, that during his stay at Amsterdam, he met with a physician of eminence, who had used

this remedy about two years; that he considered it superior to the other in every respect, as it was seldom that more than half the quantity, of what was necessary of the ordinary Bark, was required to answer the intended purpose.

The same gentleman adds, that many people in Germany had tried the red Bark, but that some of them had been disappointed in their expectations, for that, from the avarice of those who dealt in the article, it had been much disguised and adulterated. In proof of this, he compared a quantity of red Bark, which he had procured when he was in London, with that which was kept by the druggists and apothecaries in that part of the world, and found that there was little or no resemblance. He mentions likewise, that a physician, who had left Vienna a very short time before, assured him, that this kind of Bark was much used there, and in such high esteem, that it was probable no other would be employed, if a constant supply of it could

be

be obtained in its genuine and undisguised condition;

From these circumstances, together with the translation of Dr. Saunders's Treatise into Latin, by a physician in Flanders, who also speaks very highly of it, we may venture to conclude, that by this time the red Bark is known and esteemed in many parts of the continent.

If it had appeared necessary, I might have extended this chapter to a considerable length, by inserting communications from many of my acquaintance in the medical line; but such a plan being foreign to my purpose, I shall soon bring it to a conclusion. Before this is done, however, I must beg leave to mention the authority of my worthy friend, Mr. Farquhar, of Great Marlborough-street, deservedly esteemed both for his abilities and experience. He is so well satisfied of the superior efficacy of the red Bark, that he has constantly had recourse to it in obstinate and difficult cases, where the common Bark failed, for several years past, and with such
remarkable

remarkable success, that he considers himself extremely fortunate in having a small quantity of it still in his possession.—A well-marked *quartan intermittent*, in a child scarcely two years old, which is very uncommon, attended in the beginning with convulsions, was under his care lately, and, having tried the common Bark without the desired effect, he administered some of the red, which speedily subdued the disease.

I shall only add one case more, with which I have been favoured by my friend Mr. Smith, a well-informed practitioner at Stoke Newington. As it is not only a strong illustration of the efficacy of this remedy, but merits attention in other respects, it is inserted in his own words.—

“A poor woman, aged fifty, of a plethoric habit, after walking five or six miles on a warm day, and being exposed to a shower of rain, was seized, in the course of twenty-four hours, with some common inflammatory complaints, which at length terminated in a true tertian intermittent. Under the direction of her
“apothecary,

“ apothecary, the usual remedies had been
“ exhibited, but principally the common
“ Peruvian Bark in large doses, for the
“ space of six months, and though she re-
“ tained it on her stomach, the symptoms
“ did not abate. The paroxysms returned
“ with their usual regularity, her counte-
“ nance became pale, her skin flaccid, and
“ loss of appetite, with some disagree-
“ able hectic symptoms, promised soon to
“ destroy her remaining strength. In this
“ state I first saw her, and directed the
“ *red Bark* powdered to be made into an
“ electuary with simple syrup, prescribing
“ the bulk of a nutmeg to be taken every
“ hour during the absence of the fever.
“ After taking the first pot, which con-
“ tained one ounce and half, in the space
“ of a day and night, she complained of
“ its feeling heavy at her stomach; but the
“ fit only returned in a trifling degree. The
“ electuary was repeated, and finished in
“ the same space of time as before. It
“ was followed by a nasal hæmorrhage, but
“ she had no return of the paroxysm; and
“ though

“ though she took no more of the red Bark,
 “ and more than twelve months have elapsed,
 “ she has had no relapse, has recovered
 “ her strength and spirits, and is now
 “ able to undergo any fatigue. I may just
 “ add, that I have frequently experienced
 “ the efficacy of the simple decoction of
 “ red Bark, administered to children labouring
 “ under intermittents.”

The different facts and authorities, in
 favour of the red Bark, being now stated,
 the reader will have it in his power to draw
 a conclusion. There are few, I am persuaded,
 who doubt the superior powers of this remedy;
 and yet there are many who do not view it
 in that important light, to which it is fully
 entitled. It is my wish to call forth the
 attention of these, whenever a supply of it
 shall be obtained, that mankind in general
 may be benefited by the active and proper
 discharge of the duties of their profession.

To those who have unjustly condemned it,
 on the strength of a single case, or of a few
 cases, I would recommend a farther
 and

and fuller trial of it, observing at the same time, as Vogel did with regard to the injurious qualities which were attributed to the common Bark, “ Contra accusatores
“ defendere laudatum corticem, superva-
“ cuum. Ipsi illi sponte, sententiam suam
“ mutaturi sunt, si modo velint vires ejus
“ experiri præjudicio seposito.”

C H A P. III.

Attempt to determine whether the red Bark is the Cinchona Officinalis of Linnæus, a Variety of it, or a different Species of the Genus Cinchona only.

THE resemblance which has been traced in the sensible qualities, analysis, sensible effects on the body, and power of curing diseases, of the quilled and red Bark, seems sufficient to authorize its being referred to the head of the true Cinchona Officinalis of Linnæus. But, as some

some difference has been observed in their chemical nature, independent of the greater proportion of active and resinous parts in the red Bark, the action of Magnesia upon it not being analogous to the effects produced with common Bark, we should rather perhaps consider the red Bark as a variety of the *Cinchona Officinalis*, than as the *Cinchona Officinalis* itself, or a different species of the genus *Cinchona* described by Linnæus.

The common Peruvian Bark, although frequently unsuccessful in the cure of intermittent fevers and other diseases, has nevertheless been hitherto esteemed, with justice, the most effectual remedy; none of the most powerful astringents having equalled it. Whatever superiority, therefore, is possessed by the red Bark, must be derived, not from a greater degree of astringency only, but from a more perfect combination of the different parts of which Bark consists, or from some variation in the proportion of the constituent parts, which, among other considerations, renders

it probable that the red is only a variety of the common Bark.

But there are several other circumstances which may be mentioned in favour of this supposition. Most of the authors who have treated of Peruvian Bark, have admitted a red species, and Condamine even allows, that it is the most powerful in the cure of diseases. Farther, the red Bark scarcely differs more in its appearance from the quilled, than some other varieties of the common Bark, which are considered extremely genuine. I allude more particularly to the Bark which is almost black externally, and sometimes in large pieces. No person would doubt that this was a species or variety of the *Cinchona Officinalis*, and the appearances of the red Bark are not less favourable to a similar opinion. It may be observed also, that the chests of common Peruvian Bark almost always contain numerous small pieces of genuine red Bark; and I once recollect to have seen a beautiful specimen of the quilled Bark, within

within which was contained a smaller *quilled piece* of excellent red Bark.

The natural history or botanical description of the red Peruvian Bark was very imperfect, till the information which was not long ago communicated to the Royal Medical Society at Paris, by Dr. Anthony de Jussieu, from the papers of his uncle, the late M. Joseph de Jussieu, one of the French academicians who went to Quito, in Spanish America, in order to ascertain the figure of the earth, and who died a few years since at Paris. In this account of Peruvian Bark, M. de Jussieu agrees with his fellow-traveller, M. de la Condamine, in his description of the genus, but admits a greater number of species.—These, however, Dr. Simmons*, in his letter to Dr. Saunders, giving a concise view of the subject from the Transactions of the Royal Medical Society of Paris, thinks may be very properly reduced to

* Saunders on the red Bark, 4th edition, page 166, and London Medical Journal, vol. iv. page 305.

two, as the others seem to be only varieties.

The first species includes the red, yellow, and knotty Barks, all of which have smooth leaves, flowers of a purplish colour and inodorous, with a Bark that is bitter, and more or less coloured. Of these three, the red is held in the highest estimation, and it is this sort of Bark, according to M. de Jussieu, which was employed in the early days of this remedy in Europe, and from which its reputation was established. The second species includes the white Barks, of which there are four varieties. They have all broad, roundish, hairy leaves; the flowers are red, very odoriferous, and furnished with hairs on their inner surface; the fruit is longer than that of the former species, and the outer Bark is of a whitish colour. In two of these varieties, the inner layers of the Bark are of a reddish hue: they have a slight bitter taste, and when fresh, are said to possess a slight febrifuge quality, but which they soon lose. The Bark of the

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other two is intirely white, insipid, and of no efficacy. — Several other articles of information, respecting the red Bark, are contained in Dr. Simmons's letter, and among the rest, the agreeable account that it had been recently discovered in America, in the province of Santa-Fe, from whence there was reason to hope it might be procured by a more easy and regular conveyance than could otherwise have been obtained.

A farther illustration of the opinion that the red Bark is only a variety of the *Cinchona Officinalis*, is furnished by the facts relating to the discovery of a species of *Cinchona* in the island of St. Lucia, in the West Indies. Dr. Saunders has favoured me with the following extract from a letter written by Dr. Young, one of the Physicians to the troops in the West Indies, during the war. — “As to the colour of the
 “St. Lucia Bark (or *Cinchona Carribæa*,
 “as it may be called) it is various. Some
 “of it is red, some of a chocolate colour,
 “and some again of a pale ash colour;
 “and

“and this difference depends on the
“variety in point of age, soil, &c.—
“All young trees have their Bark pale,
“and old ones red; but trees, although
“they may be old, if they grow in a rich
“moist bottom, have their Bark white;
“and young trees, provided they grow
“among rocks, and in a dry, gravelly,
“barren soil, have it reddish.”—Thus, we
have reason to conclude, that the red Pe-
ruvian Bark is only a variety of the Cin-
chona Officinalis; that it is the most effica-
cious form of it; and that the difference
depends on age, variety in the soil, expo-
sure to cold, moisture, &c.

The small quilled pieces of red Bark,
which are frequently met with, have long
since induced Dr. Saunders to relinquish
the opinion, which he at first adopted,
that the difference depended on the Bark's
being taken from the trunk or branches of
the same tree, in the manner of the oak
Bark.

SECTION III.

GENERAL OBSERVATIONS ON PERUVIAN

BARK.

C H A P. I.

*Inquiry concerning the Modus Operandi of
Bark in general.*

THERE are few persons, at this day, who believe that the good effects of Peruvian Bark are produced by its action on the fluids of the body.—It is supposed, with much greater reason, to exert its operation on the solid parts, particularly on the stomach, which is one of the most important organs in the animal economy, and intimately connected with every part of the system. An attention

to this circumstance, and a consideration of the sudden manner in which the Bark sometimes operates, as in preventing the return of an intermittent paroxysm, when administered a very short time only before the expected accession, are strong confirmations that it acts on the solids and not on the fluids.

But this is no proof that some of the Bark does not enter the circulation. The articles which are absorbed and carried into the blood, are more numerous than is generally supposed. Many of them may be traced in the secretions in an unaltered condition, such as nitre, rhubarb, various saline bodies, and certain essential oils; and the effect of the rubia tinctorum, or madder, on the bones, is well known. It would be a curious inquiry to ascertain the remedies, on the contrary, which do really undergo an alteration in the stomach, and to determine, with regard to the Bark, how far the gastric fluid of the stomach is capable of acting upon it, or changing its nature. If it is in any degree dis-

solved or digested, we may readily conceive that it may be absorbed and present in the circulating mass, although we should have no means of detecting it. And thus we may explain why no change should be produced by the addition of a chalybeate to the serum of blood, drawn from a patient who has previously taken liberally of the Bark.—I recollect to have seen this experiment made by the late Dr. Keir, physician to St. Thomas's Hospital, whose death cannot be too much regretted by all who had the happiness of being acquainted with him. One of his hospital patients, labouring under an intermittent fever, had been taking large quantities of Bark several days, and had swallowed one of the doses about an hour previous to its being necessary to take away a quantity of blood, for the relief of a peripneumonic affection, with which he was suddenly attacked. The blood was accordingly drawn, and a chalybeate solution added to different portions of the serum, but no traces of the astringent matter of the Bark could be discovered. Hence

we may infer, that Bark does not enter the circulation possessed of its ordinary qualities.

With regard to the antiseptic property of Bark, I can by no means agree with Dr. Macbride, who explains it in part on the principle of fermentation, which he supposed it must necessarily undergo in the stomach. The time, during which it remains there seems evidently too short to admit of such a change. It is more probable that the Bark is possessed of a direct antiseptic or antizimick property, which, within certain limits, would rather retard than promote fermentation. Even in a vial, under circumstances the most favourable to such a process, an infusion or decoction of Bark will remain without the slightest appearances of fermentation, for one day at least, sometimes two days. Similar preparations of the red Bark indeed will continue perfect many weeks. —We must conclude, therefore, that the ideas of Dr. Macbride, on this subject, are not well founded, and that the antiseptic

power of the Bark, in diseases which have been termed putrid, arises from its tonic operation, the stomach and whole body being invigorated by it in a manner peculiar to itself; for although many bitters possess a power somewhat similar, increasing the tone of the stomach in a greater or less degree, yet we do not find that their effects are so readily or completely extended throughout the whole system.

The astringent and bitter properties of Bark do not appear sufficient to explain its operation. There are substances in the Materia Medica more intensely bitter, and others manifestly more astringent, and yet no person has produced, by the combination of these, a remedy possessed of the efficacy which we are accustomed to admire in good Bark. It is better therefore to confess our ignorance, and say that we are unacquainted with the principle on which its action depends, or that it is a peculiar modification of bitterness with astringency, or with some other principle, which we shall never, perhaps,
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be able completely to detect, and which seems to be possessed in a much higher degree by the red Bark; for if this article contained a greater degree of bitterness and astringency only, all its good qualities might be obtained by an increased quantity of the common Bark, which does not appear to be the case.

It will be proper now to make some remarks on the class or order of the *Materia Medica*, to which the Bark is best referred. Some have placed it among the *astringents*, others among the *stimulants*; and yet, as if each in turn doubted the propriety of the arrangement, they all annex the title of *tonic* to it. We shall see afterwards, how far a class of strengthening or tonic remedies should be included in that division of the *Materia Medica*, which arranges the various articles that compose it according to their sensible effects and operation on the body. In the mean time, let us inquire whether a tonic or strengthening power can be ascribed either to the class of *astringents* or *stimulants*. Should it be proved

proved that these are not necessarily tonic, and, on the contrary, that strengthening remedies are not necessarily astringent or stimulant, then the Bark, which every person will admit to be a strengthener, cannot with propriety be ranked either under the head of astringents or stimulants.

Now, that the action of Bark does not arise from its astringency, is proved from the observation that gum kino, galls, and many other astringents, which possess this quality in a degree greatly superior to Bark, evident not only to the taste, but by chemical trials, and by their power in stopping hæmorrhages, have nevertheless little or no effect in strengthening the body in ordinary cases of debility; and Bark, on the other hand, so successful in restoring the strength of the body, has no immediate power of giving a check to hæmorrhages. There can be no reason then for classing this remedy among the astringents.

The articles which are comprehended under the head of stimulants, are very numerous.

merous. Some operate powerfully and quickly in exciting the action of the heart and arteries, and the functions of the whole body; others in a more gradual and moderate manner. Some almost invariably produce a state of debility, consequent on their stimulant operation; while others are observed to increase the vigour of the body. The former have been called by some persons, *simple stimulants* or *irritators*, the latter, *tonic stimulants*. But, as it is not in our power to determine the exact manner in which the articles that are strictly termed tonics, or strengtheners, operate; and as no increased action can be observed in general during their operation (particularly in the case of Peruvian Bark, as was mentioned in treating of its sensible effects on the body), it will be better, I conceive, until a greater number of facts are collected, to refer it to a class of tonics, or strengtheners, called *remedia roborantia**

* Vid. Conspect. Med. Theoret. Auctore Jac. Gregory, vol. ii. p. 218.

by several writers on *Materia Medica* and *Therapeutics*.

At the same time, however, that an arrangement has been assigned to Peruvian Bark, we are not to suppose that its tonic power will explain its operation in all the diseases where it is employed with advantage. In treating of fevers, for instance, we shall find all our knowledge on the subject insufficient to afford any information concerning the method in which it produces its salutary effects.

CHAP. II.

Different Methods of exhibiting Bark; with the various Articles which are added to it, and the Purposes which they are intended to answer.

MOST practitioners prefer the Bark in substance, from an opinion that some of its active parts are lost in every other way of administering it; and it must be allowed, that when the stomach is capable

pable of retaining it, and its use particularly required, that this is the most effectual method of exhibition: but we shall find hereafter, that there are many cases, in which the more moderate action of Bark is only necessary, and to which the different infusions and decoctions of this remedy are extremely well adapted. Instances occur frequently, likewise, in which the Bark cannot possibly be rendered agreeable to the stomach, in its intire condition, and where, if it should even happen to be retained, the stomach is so very incapable of subduing it, that it remains an inconvenient weight on the organ, and rather aggravates than relieves the disorder.

The best method of disguising the taste of the Bark is undoubtedly by taking it in milk, or good butter-milk; though some recommend old hock very strongly, and porter is praised both by Morton, and by Dr. Lind on the marsh fever of Bengal, as the best vehicle for it. When it is employed in substance, it should be reduced to a
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much finer powder than that which is generally kept in the shops; for nothing can be more disagreeable to some patients, than the small sharp particles of the Bark, which often remain upon the tongue and fauces, when it has not been carefully prepared. If made into an electuary, with brandy, it will sometimes be found an effectual and pleasant method of exhibition, particularly if washed down with a small quantity of Port wine negus; or, if the patient objects to the form of an electuary, it may be mixed into a draught, with a little of the mucilage of gum arabic, and some of the more pleasant distilled waters of the shops. Some persons direct the powdered Bark to be inclosed in wafer paper, and this may be tried occasionally with advantage: but with every attention of this kind it will often, notwithstanding, disagree with the patient, producing a sense of weight and oppression in the region of the stomach, sometimes followed by nausea, and even vomiting. It is necessary, on this account, to direct our views to such preparations

preparations of this remedy as are likely to be retained, when it will not answer in substance, as for instance, to the different decoctions and infusions of Bark.

In a former part of this essay, a comparison was made between the common decoction and simple infusion of Peruvian Bark; and it evidently appeared that the decoction exhibited marks of superior strength. We cannot hesitate, therefore, to give it the preference on the present occasion, and to say, that of the ordinary preparations of this article, it will in general be found the most efficacious: for, although rectified spirit of wine and brandy dissolve a much greater proportion of it, yet, on account of the heating and spirituous quality of these *menstrua*, they can only be given in a very small quantity, and in this way their efficacy is inconsiderable, in comparison with the decoction, when administered freely. It should seldom be prescribed, for an adult, in smaller quantity than two ounces five or six times a day; and it is a good practice to add some of the
tincture

tincture of the Bark, either to the decoction or infusion.

Some persons have alledged, that the infusion of Bark is particularly light, and agreeable to weak stomachs; but I have known many cases, where the patients could not be prevailed on to take the necessary quantity, on account of its bulk. A smaller quantity, then, of the decoction, which is stronger, will answer a similar purpose, the diminution of the bulk being sufficient to compensate for the more bitter and disagreeable taste. It is far from my intention, however, to exclude the cold infusion. I have repeatedly seen good effects from it, especially the infusion of the red Bark; and there are probably many cases, in which the infusion may be preferable to the decoction; as for instance, when a light tonic only is required; but in intermittent and other fevers, where the Bark cannot be taken in substance, I should certainly consider the decoction more efficacious than the simple cold infusion. We shall find presently, indeed, that by the

addition of Magnesia, an infusion may be prepared, which will, I trust, be thought preferable either to the common infusion or decoction of Bark.

The extract of Bark, if carefully prepared, will be found, on some occasions, a convenient and efficacious form of the remedy, exhibited in the manner which will soon be described. But cases now and then occur, in which neither infusion, decoction, nor extract, can be administered by the mouth; and in these, clysters of it have undoubtedly been employed, in many instances, with good effects. It is not difficult to conceive that this should happen, as the intestines appear, from their connection with the stomach, to partake in some degree of the power and energy of that organ. The Bark, therefore, by acting on the muscular and living power of the intestines, has its action probably in the first place transferred to the stomach, and afterwards to the whole body.

It has also been proposed, and actually put in practice, to apply the Bark exter-

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nally, in the form of waistcoats quilted with it. This method is strongly recommended in the London Medical Observations and Inquiries*; and although we cannot doubt the testimony in favour of it, there is certainly some difficulty in understanding the manner in which the Bark operates, under such a mode of application. A remarkable sympathy, it is true, exists between the stomach and skin, so that if the Bark could be freely applied to the latter, a favourable operation might naturally be expected to follow, but in theory, the cuticle seems to be so completely interposed between the remedy and *cutis vera*, as to prevent every action of that kind.

Some persons have employed it, likewise, in the form of a bath or fomentation; and I have been informed, that it has been tried in this way in Germany with success, for the cure of intermittent fevers. A child, in particular, labouring

* Vol. ii. p. 245.

under

under an intermittent, was placed, for the space of ten or fifteen minutes, three or four times a day, in a strong decoction of Bark, and is said to have recovered from the fever by this method of treatment; but it must be obvious, that a single case of this kind is insufficient to afford any decided conclusion.

Farther, the Bark has been sometimes used in poultices and dressings to gangrenous and ill-conditioned ulcers, and more especially in gargarisms for the putrid ulcerated sore throat. I shall not absolutely deny its utility in these different modes of application; but, as they appear to have originated from the idea of its antiseptic power, and as any direct tendency of this nature is inconsiderable in the Bark, in comparison with many other substances (its antiseptic quality, when given internally, being derived chiefly as a consequence of its tonic action on the stomach), it may be proper to mention, that the decoction of it can scarcely be considered in any other point of view, when used for such

dressings and gargarisms, than as a convenient vehicle for the more powerful articles of tincture of myrrh, vitriolic acid, marine acid, and other stimulants and antiseptics, which are commonly added to it.

But to return to the subject of the internal use of Bark. It may be observed, that there are many cases, in which the life of the patient seems to depend on this excellent remedy, and in which none of the common preparations of it can be retained on the stomach. At such times the mode of prescription should be frequently varied, by making different additions to the Bark, till at length an agreeable and efficacious preparation be obtained. Such a variety in prescription does not appear to be sufficiently studied by physicians. If the first that is thought of does not succeed, the remedy is frequently laid aside, and one of inferior efficacy substituted in its place, to the great detriment of the patient. There are many persons who can never retain any of the saline purgatives, unless managed with the greatest nicety.

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This is illustrated in the case of Glauber's salt, which is much improved by the addition of Crem. Tartar, Cinnamon-water, and a small quantity of sugar. Acids, likewise, render the decoction of Bark more pleasant to the taste, and agreeable to the stomach, as we shall see more fully hereafter.

These observations lead immediately to the consideration of the different articles which are added to the Bark, and which are so numerous, that to have collected all of them would not only have been a laborious, but an unprofitable pursuit; as many, which are to be met with in the writings even of the most eminent physicians, seem either of no importance, or the intention of the prescriber is extremely obscure. Some of the additions will more readily occur when, treating of the different diseases in which Bark is indicated, and will be unavoidably referred to that part of the Essay.

In the mean time, we may refer them to four heads or divisions. 1st. Those which

are added with a view to render the Bark more soluble in certain *menstrua*. 2d. Those which are employed in order to obviate any inconvenient effects arising from the remedy in a separate condition. 3d. Such as are used with the view of rendering it more agreeable to the stomach, giving rise to a great variety in prescription. And 4th. Those which more especially improve its powers as a medicine, or diversify its mode of action, so as to adapt it to particular diseases, on which, in its separate state, it could make little or no alteration.

To the first head may be referred the additions of gum arabic and liquorice to decoctions of Bark. These enable the water to dissolve an increased proportion of the resinous part, and, by giving a degree of consistence to the liquor, adapt it for the suspension of those resinous particles, which are only diffused, and would otherwise fall to the bottom of the vessel.

In the second division are included those substances which are joined with the
Bark,

Bark, either to obviate costiveness, when that effect is produced, or to restrain diarrhoea, when troublesome. To answer the first intention, a few grains of rhubarb are commonly added to it; but it would be better in fevers, perhaps, to trust chiefly to clysters, or to a watery infusion of rhubarb with orange-peel, which is the best method of administering this purgative remedy. In order to restrain diarrhoea, a few drops of laudanum are generally given with each dose of the Bark; but I have seen cases, in which the opiate occasioned such disagreeable effects on the stomach, that it became necessary to omit it, or administer opium in a solid form, joined with some of the more grateful aromatics. The Bark should be prescribed in these cases in decoction, with the addition of the tincture of japonica; and there are other astringents, which may be used sometimes, likewise, to answer the same purpose.

The third and fourth divisions are much connected, as many of the substances

which render the Bark agreeable, are found at the same time to increase its efficacy. This is remarkably the case with many of the aromatics, such as orange-peel, cinnamon, Winter's bark, canella alba, cascarilla, nutmeg, ginger, &c. These may be given, in suitable proportions, in fine powder, with the Bark in substance, or may be made into decoction with it. Decoctions and infusions of Bark are rendered more agreeable to some patients, by the addition of certain syrups, as of the syrup of orange-peel, cloves, &c.; but care should be taken that a moderate quantity of the syrup only be employed, as the remedy may otherwise prove unpleasant to some persons, independent of the increased tendency which it acquires to fermentation.

Acids may be enumerated also, with much propriety, among the additions which contribute to the elegance of prescription, but they appear likewise to promote the efficacy of the Bark; hence the frequent use of vitriolic acid, more especially, in form of the elixir vitriol of the shops.

Infusions

Infusions of Bark in different kinds of wine constitute an agreeable, though not always an efficacious method of administering this remedy. Having seen, in the course of the experiments, that neither Rhenish nor Port wine acts very powerfully on it, we should rather, perhaps, advise these to be given with the powdered Bark, or that the electuary or bolus's of it should be washed down with Port or Rhenish, mixed with water, according to the inclination of the patient. Dr. Percival very justly observes, that the cold infusion is much improved by the addition of a small quantity of good brandy; and the same remark is applicable to many of the spirituous waters and tinctures of the shops, as cinnamon-water, nutmeg-water, stomach tincture, aromatic tincture, and tincture of cardamoms. The liquorice, mentioned before for another purpose, is supposed by many persons to conceal very effectually the taste of the Bark, and may be employed either in the root, or inspissated juice. The proportion of this substance

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stance should be greater too when the decoction is intended for children than adults, as the former are frequently encouraged to take remedies, from the presence of a quantity of sweet or saccharine matter, which would be disagreeable to a person more advanced in life. An elegant preparation may be contrived for children, by rubbing the extract of Bark into an emulsion, with some sugar and a few almonds; or by dividing the extract thoroughly with sugar-candy and gum arabic, and then adding gradually a sufficient quantity of the simple cinnamon-water. Farther, the extract of Bark, after being well rubbed with sugar and gum arabic, may be suspended in milk occasionally with advantage.

The much-admired tincture of Dr. Huxham is certainly an elegant, and sometimes an efficacious preparation of the Bark, being well suited to some cases of indigestion and weakness of the stomach, where the remedy in substance, or in any bulky

bulky form, is productive of inconvenience. In adding tinctures of Bark to the decoctions or infusions of it, the Huxham's Tincture should generally be preferred to the more common and simple tincture.

Among the additions which are made to the Bark, with a view of promoting its efficacy, may be ranked, in the first place, the different chalybeate preparations; several of which, as the *Chalybis Rubigo Præparata*, *Chalybs cum Sulph.* &c. are often joined with it in chronic diseases, in form of an electuary, together with aromatics; and there can be no doubt of the good effects which frequently result from such a combination. If an electuary be unpleasant, pills may be made with the extract of Bark and sal martis.

Of the aromatics which promote the efficacy of Peruvian Bark, the cascarilla appears to be the most important, and admirably adapted to malignant dysenteries, chronic dysentery, and to obstinate diarrhœas. In many malignant fevers, gangre-
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nous fore throats, and other diseases of that nature, campher, Virginia snake-root, and vitriolic acid, form valuable additions to it, and have been strongly recommended by Huxham, and many other eminent physicians. I have seen myrrh combined with the Bark, in cases of gangrenous fore throats, with apparent advantages; and it is said, that such a composition is particularly effectual for the removal of intermittent fevers; in the treatment of which, alum, chamomile flowers, and numerous bitters, aromatics, and astringents, have likewise been proposed, and have in many instances highly improved the Bark, when of such an indifferent quality as to have been inadequate alone to the cure of the disease.

Crude sal ammoniac has been long employed by many physicians, as an addition to this remedy, in obstinate intermittents, complicated with dropsy, and a diseased condition of the viscera. This saline body, though stimulant in one point of view, is rather to be considered a refrigerant when given internally; and yet its utility in inter-

termittents has been admitted by many practitioners, which is a circumstance that no satisfactory reasoning on the nature of fever, or of the remedy, could have suggested.—In cases of dropfy attendant upon intermittent fevers, or in dropfies from other causes, the sal diureticus, and sometimes the fixed vegetable alkali, are joined to the Bark, and have occasionally proved serviceable by their diuretic effects, at the same time that the whole system has been strengthened, and a return of the disorder prevented.

The only remaining additions, which I shall speak of in this place, as promoting the efficacy of Bark, are those of lime-water and Magnesia, which the experiments * formerly related have placed in a very promising point of view. That the result of these trials corresponds with the actual exhibition of such preparations of the Bark in cases of disease, I have endeavoured to ascertain by attentive observation

* Vide page 38, 48, &c.

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for several months past. I have been long convinced, indeed, of the efficacy of the infusion with lime-water, and am acquainted with several practitioners of experience, who frequently have recourse to it with the best effects; and with regard to the preparation with Magnesia, its sensible qualities are so highly in its favour, that Dr. Saunders has been induced to administer it frequently, both in the hospital, and in private practice; and although very extensive trials would be necessary, in order to form a decided conclusion, those which have been hitherto made, have been far from proving unfavourable to this remedy.—I have communicated my experiments and observations to several practitioners of my acquaintance, and after a trial of the infusion, both in public and private business, I have received as satisfactory accounts from them as the nature of the subject will permit. In short, any person who will take the trouble of preparing an infusion of Bark with Magnesia carefully, in the proportions, and under the circumstances fully

fully explained in the foregoing experiments, will soon be convinced, from its taste and appearance, that it must prove far more efficacious than the common infusion. The rich red colour, its transparency for three or four days, and the length of time which it remains sound, without the addition of any of the spirituous waters, are all qualities which should operate in obtaining it an extensive application to the purposes of medicine. It appears to me to be an excellent substitute for the decoctions and infusions of the red Bark, and if this be really the case, it is no small acquisition.

Notwithstanding the remarkable strength of the infusion with lime-water, that with Magnesia is preferable on several accounts; for, independent of its original superior strength, as far as experiments could direct us, it is less disagreeable to the taste, and keeps a much longer time without precipitation. We are not to suppose, however, that because the preparation of Bark with lime-water becomes turbid in a day or two, it loses much of its strength. It does not
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appear at such a time to be in a state of fermentation, and still retains its strong bitter taste.

But besides employing Magnesia in infusion with Bark, I would propose that they should be given more frequently in substance, than has hitherto been the practice.—Some physicians have occasionally prescribed powdered Bark and Magnesia, with a few grains of the aromatic species, but with no other expectation from the Magnesia, than that of obviating costiveness.—I leave it to be determined by my readers, whether there are not good grounds to expect that the Bark would be rendered more efficacious likewise by such a mode of exhibition.

C H A P. III.

Remarks on the Pharmaceutical Treatment of Bark.

THE strength of the different infusions of Bark will depend very much

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on the diligence of the operator in their preparation. Ten or fifteen minutes diligent trituration, however, will in general be sufficient for every useful purpose. In making decoctions, the heat should always be moderate, and it seems quite unnecessary to carry the evaporation to the extent which is commonly prescribed; thus, two pints of water are directed to be boiled to one, whereas one pint and a half boiled or evaporated to one only, would be far preferable.—If any aromatic substances are to be employed, it is obvious that they should not be added until the decoction is nearly finished, as they contain an essential oil, the greatest part of which would otherwise be dissipated. For the same reason the vessel should be covered, till the liquor is sufficiently cool to be strained. Some have recommended that this should be done while it continues pretty warm, and that it should be passed through a coarse filter, such as coarse linen, or clean tow; by which means, that part of the resin of the Bark, which is only in a state of diffusion, and would fall to the bot-

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tom during the cooling of the liquor, may be preserved, as well as that portion of it which, though completely dissolved, would in part be deposited during the alteration of temperature, as happens in many other solutions.

Infusions and decoctions of the common Peruvian Bark, are only calculated for immediate use, i. e. they should be recently prepared daily, or at farthest every second day. The infusion with lime-water will keep sufficiently sound three days, and that with Magnesia more than a week.

In preparing the extract of Bark, the greatest care should be taken to avoid *em-pyreuma*, by applying the heat very gradually, and attending to the circumstances, concerning the water bath, which have been proposed by Dr. Percival*. The extract prepared according to the Edinburgh Pharmacopœia, deserves the preference, being a combination of the mucilaginous and resinous parts, by which the

* Experimental Essays, vol. i. p. 76.

latter are rendered more soluble in the stomach, and the powers of the remedy promoted. The spirituous extract, or resin of Bark, indeed, should seldom be used without the addition of mucilage. It would even be an improvement, perhaps, to add a quantity of the mucilage of gum arabic to the extract, which is prepared by water as well as spirit. By adding gum arabic in powder, with a moderate quantity of Bark finely levigated, to the decoction and tincture, when evaporated to a certain point, a very efficacious extract, I should imagine, might be prepared. We shall thus, in a good measure, avoid *empyreuma*, as it is found that the extract of hemlock is more perfect and active, when the powdered leaves are mixed with the juice, previously evaporated to some degree of consistence, than when prepared in any other way.

The *essential salt of Bark*, prepared and sold by Mr. Godfrey, in Southampton-street, appears to be a very delicate extract, procured intirely free from *empyreuma* by

means of the water bath. It is made to assume a curious plated appearance, somewhat resembling shell-lac, though much thinner.—The complete and ready solution of this preparation in the saliva, and in water, while it is but moderately affected by proof spirit, and not at all by rectified, would seem to indicate the presence of a quantity of the mucilage of gum arabic. But whether this be the case or not, there is every reason to believe that it is possessed of considerable efficacy, and worthy the attention of the profession.

All the different tinctures of the Bark should be made, in general, either with rectified spirit of wine or brandy; the experiments formerly related having shewn that these are among the best *menstrua*, the rectified spirit more particularly.

If a tincture be wanted for immediate use, i. e. two or three days after the materials have been put together, it may be obtained sufficiently strong in that time, by employing a larger proportion of the Bark than is directed in the London Phar-

macopœia, by shaking the bottle frequently, and by the moderate application of heat. But in case the tincture can be kept two or three weeks, the common quantity of Bark only will be required, as the spirit will have time enough, during that interval, to become strongly impregnated.

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...**P. A. R. T.** ...
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S E C T I O N I

C H A P. I

OF FEVERS.

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P A R T II.

OF THE DISEASES IN WHICH BARK IS MORE PARTICULARLY REQUIRED, WITH OCCASIONAL REMARKS ON THEIR NATURE AND MODE OF TREATMENT.

S E C T I O N I.

C H A P. I.

Of Fevers.

IT has been observed, with the greatest truth, by many persons, that whenever a valuable remedy is first introduced into practice, it is injudiciously employed in a variety of diseases, to the removal or alleviation of which it is totally inapplicable. This observation, however, has less reference, perhaps, to Peruvian Bark, than

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to any article of the *Materia Medica*; for, although it may sometimes be improperly and indiscriminately prescribed; and although it should be granted, that the unskilful management of it in many diseases, on its first introduction, assisted in bringing it into disrepute for a time; yet, if we take a view of the numerous disorders in which its utility is universally acknowledged, we cannot but consider it one of the greatest acquisitions which the provident hand of nature has afforded us.

The power by which it prevents the *recurrence* of febrile paroxysms, and those more especially of the intermittent kind, is the most remarkable that we discover in it; a power which it may be said to possess in a great measure exclusively; and which, without much impropriety, may, I think, be termed specific, as its operation in producing this effect has never yet been satisfactorily explained upon any principle of the animal œconomy, of fever, or of the sensible qualities of the remedy itself.

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This opinion is strongly supported by the sudden manner in which it operates; for although intermittents have been sometimes cured by the use of bitters, astringents, and aromatics; these have certainly operated in a more gradual way only, independent of the frequent occurrence of relapses, and the imperfect state of health which the unhappy sufferers have often had to struggle with for a long time afterwards:—farther, I have not been able to learn, that any other remedy can be depended on, for the effectual removal of the dangerous remitting fevers, which are so extremely prevalent in many warm climates.

The prejudices which operated formerly against the employment of Bark in intermitting fevers, have so far subsided, and the practice of administering it early in the disease appears now to be so generally adopted, that I should consider it loss of time to insist upon the various arguments which might be adduced in support of it; especially as the propriety of the measure

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is very strongly and ably inculcated in other publications on the subject *.

Intermittent fevers have been divided not only into vernal and autumnal, but into quotidian, tertian, quartan, &c.: these, however, being generally known and understood, and the symptoms of cold, hot, and sweating stages, constituting a paroxysm of any one of them, being fully described by Dr. Cullen, in his First Lines of the Practice of Physic, and by many other practical writers, it would be unnecessary to say more at this time, than that the succession of stages just mentioned, is very far from occurring with that degree of regularity, which persons who have not been accustomed to see the disease are ready to believe and expect.

The irregular form of intermittent is by no means unfrequent; hence we sometimes meet with patients in whom the cold stage is wanting; and the same has been observed with regard to the hot and sweat-

* See Saunders on the red Peruvian Bark, and Rigby on the use of red Bark in intermittent fevers.

ing stages. Of the truth of these observations, no person who has been familiar with the disease can entertain the smallest doubt; and, what is still more extraordinary, I suspect that future inquiries will prove, with equal certainty, that the hot may even precede the cold stage. I am pretty well convinced, that cases have occurred to my notice, which would warrant such a conclusion; but as they have not been numerous, I would for the present rather avoid any positive assertion on the subject.

In this manner then does the disease seem to admit of every possible variety; a circumstance which, it must be confessed, tends very much to obscure the theory of these fevers. At any rate, such irregular succession of the stages corresponds but very indifferently with the reasoning in favour of debility and spasm*; and, not-

* See Cullen's First Lines of the Practice of Physic, vol. i. in which the theory so ingeniously supported necessarily involves the regular succession of the cold, hot, and sweating stages.

withstanding

withstanding all the learned and ingenious investigations which have been instituted at different times, I am afraid we must candidly confess our ignorance.

There are few points in pathology, which seem involved in greater obscurity than the action of *miasmata* and contagion on the human body; so that the theory, not only of intermittents, but of fevers in general, is to be considered extremely imperfect: for although it should be granted, that debility for the most part predisposes the body, or renders it susceptible of the impression of these noxious powers; or however much we may be disposed to allow, that both debility and spasm occasionally make a part of fever, and are to be attended to in the cure; yet all that can be done, is to admit them as symptoms, and not as the full and complete proximate cause. Many arguments might be adduced in support of this opinion, but it would be foreign to the purpose to enlarge farther on it here, than with a view to the subject more especially under consideration, which

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of itself, I apprehend, will enable us to perceive that the theory in question is altogether inadequate to an explanation of the phenomena.

Peruvian Bark is said to operate in the cure of intermittents by its tonic powers, or by its power of removing the debility, which is the cause of the spasm, &c. Now, that this is not the operation of this remedy in such cases, is rendered obvious by the consideration, that in various instances of debility, unconnected with fever, we are unable to effect a cure by Bark alone. Although often serviceable under such circumstances, it is only in a gradual manner; and, on the whole, the strength of the patient can be more speedily restored by a proper regulation of diet and exercise, with a moderate quantity of wine, than by Bark of the most genuine quality. But it is essentially different with intermittents; good Peruvian Bark being preferable to any remedy whatever, though the plan just mentioned may sometimes assist

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in the cure, and is generally an object of importance. I rest the opinion, however, on those cases of obstinate intermittents, which, after having resisted the most nourishing diet, wine, &c. have, in the course of a few days, yielded to the proper administration of Bark; nay, occasionally to its first exhibition, so that the paroxysm has not afterwards returned. For the truth of this assertion, I appeal to the experience of every candid man, who has had an opportunity of treating the disease: and, on the other hand, the Bark has never been observed to produce so sudden and salutary a change in cases of debility unconnected with fever.

Farther: vernal intermittents, instead of exhibiting appearances of debility, have sometimes been attended with symptoms rather of an inflammatory kind; and yet the remedy in question has been found efficacious in this as well as in the other form of the disease. The conclusion, therefore, which may be fairly deduced, is, that neither

ther the operation of Bark, nor the real nature of fever, have hitherto been satisfactorily explained.

Physicians differ much, even at this day, with regard to the best time and method of administering the Bark in intermittent fevers ; some considering previous evacuations necessary, and others condemning them, except under particular circumstances, such as the stomach and intestines being loaded with bile or other offensive matters, in which case, an emetic and gentle cathartic are allowed by most to be proper. For my own part, I cannot help believing, that evacuations are in general unnecessary, and may sometimes do harm ; for I have seen many cases effectually cured, without having the slightest recourse either to emetics or cathartics. I must confess, at the same time, that other cases have occurred to my notice, in which the Bark could not be retained on the stomach, until an emetic had been administered. Whenever, therefore, the patient complains of nausea, loss of appetite, and oppression about the stomach,

stomach, especially if the Bark should prove disagreeable, it will be advisable, I conceive, to try the effects of gentle evacuations, either by vomiting or purging, before we persist in its use. Sickness alone, however, does not always seem a sufficient indication for the use of an emetic. Being a frequent attendant on debility, which is a condition much connected with most agues, and not uncommonly forming a part of the aguish paroxysm also, it is rather to be cured by Bark than otherwise; and we accordingly often observe, that in proportion as the return of paroxysms is prevented, the nausea abates; and, the different secretions being gradually restored to their healthy condition, the foulness of the tongue is found to give way to the same remedy.

The most certain and speedy method of curing intermittents, is in general, undoubtedly, by the Bark in substance; though I have often seen them cured in a short time, at Guy's hospital, by a decoction or cold infusion of red Bark, taken in the

the quantity of a pint, or a pint and a half, daily.

When the powder is employed, it may be given in equally divided portions, throughout the whole of the intermission, in the dose of one drachm every second hour; or what may be preferable, perhaps, when the stomach can bear it, the greatest quantity may be swallowed a few hours before the expected accession, as a drachm of it, for instance, every hour, so as to finish about half an ounce in the space of three or four hours before the period at which the return of paroxysm is looked for.

This practice of administering Bark a short time before the coming on of the fit, is so free from danger, that few practitioners at present have any apprehension with respect to it; whereas in the days of Dr. Sydenham, it was considered so highly dangerous, that he relates two instances* of its producing fatal effects, and

* Vide Sydenhami Opera, p. 361, Lugd. Batav. 1726.

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expressly

expressly forbids the use of it several hours previous to the accession, or attack of the cold stage. It was natural enough, at that early period of employing this remedy, that this great man, whose caution on a variety of occasions cannot be too much admired, should draw such conclusions; but later observations have enabled physicians to correct his opinion; and we are now authorised to pronounce, that the death of the alderman, as well as the apothecary, would in all probability have happened, exactly in the same manner, had no Bark at all been administered on the days of the fatal events.

Mr. Rigby, in his Treatise on the red Peruvian Bark, suggests the use of it even during the paroxysm*, declaring, that it does not possess the quality of aggravating the hot fit, in the manner which has been supposed; and he is not the only person impressed with this idea. It is said, that at that time of exhibition, it was found re-

* Pages 101 and 102.

markably

markably effectual, by a physician of eminence, in a situation where, from the scarcity of Bark, it was necessary to make a variety of trials, in order to ascertain the method, by which the disease could be most speedily cured; so that as small a quantity as possible should be consumed. Dr. Gregory of Edinburgh has, at different times, prescribed it in this way, in the clinical wards of the infirmary at that place, and has occasionally found it answer sufficiently well; but, as we might have imagined *a priori*, it is not always that it can be retained on the stomach. Sickness has already been mentioned as a frequent attendant on agues; and it often happens, that, during the cold and hot stages, troublesome retching and vomiting are likewise present: these we should expect would be considerably aggravated, in general, by the remedy in question; and this effect has really happened so often, as to convince us, that whatever advantages such a plan may possess in some particular cases, it can never be generally adopted.

It is necessary, in certain cases of intermittents, to assist the operation of Bark by means of opium and other remedies. The great advantage resulting from the use of opium, appears to be that of diminishing the severity of the paroxysm; for, of itself, it seems altogether inadequate to the complete removal of the disease. It has been administered either before the accession of the cold stage, or during its continuance, but most frequently and successfully during the hot stage, in the manner recommended by Dr. Lind. I have taken much pains to ascertain this point, by inquiring into the method of treatment which has succeeded best in warm climates; and I have been informed, by several practitioners of considerable experience, that the latter, or that which refers to the hot stage, has obtained a decided preference; though it cannot be denied that good effects have been occasionally experienced from opium, even when taken before, or at the invasion of the paroxysm.

If intermittent fevers happen to be complicated with enlargements and obstructions of the viscera, jaundice, dropsy, hectic fever, and other disorders, the method of treatment should be somewhat varied; but it must always be an object, I conceive, to put a stop to the paroxysms of the intermittent as soon as possible, otherwise the affections just mentioned will be more and more confirmed; and notwithstanding these should prove fatal in the end, in consequence of their long continuance, yet by curing the ague, we accomplish one of the great purposes of our art; for we not only protract life in many instances, but, by removing one of the greatest sources of misery, we have, at least, the satisfaction of smoothing the avenues of death; nothing being more distressing, according to the accounts of those who have laboured under them, than the sensations which occur in a severe paroxysm of an intermittent.

When agues obstinately resist the Bark, it is proper constantly to increase the dose,

or to make some of the additions to it which have been mentioned in the chapter on that subject. In some cases too it is advisable to intermit its use for a few days, and then return to it in large doses; employing in the mean time a proper composition of bitters, astringents, and aromatics. If this caution be neglected, the effects of habit will be remarkably seen in the Bark, as the disease will sometimes continue to resist all the attempts which are made towards its removal.—The red Bark, when genuine, having never, to my knowledge, failed in removing the disease in a short time, the observations just mentioned are intended consequently to apply more especially to the common Peruvian Bark.

In the *Fragmenta Chirurgica et Medica*, lately published by Sir William Fordyce, very high encomiums are bestowed upon a purging remedy, composed of diaphoretic antimony, crystals of tartar, scammony, and saffron; and upon a draught, consisting of some of the simple aromatic waters, with

with fixed alkali, spirit of sal ammon. and syrup of wild poppies, in the cure of intermittents; which practice the learned author was led to adopt, in consequence of the numerous instances in which Peruvian Bark failed in performing a cure. It is to be hoped, however, that the experience of Sir William, on this occasion, may not induce practitioners too hastily to adopt his practice, as it has been repeatedly found that drastic purgatives (for such we would term all, into the composition of which scammony entered), so far from being conducive to the cure of intermittents, have frequently not only increased the severity of the disease, but have been actually known to occasion a relapse, when administered for the relief of dropical symptoms, which remained after the paroxysms had ceased some days. The testimony of this author is certainly very considerable with regard to the inefficacy of common Bark; but this is all that can be established from his observations, and should rather lead to the farther use of the

red Bark, than to the employment of medicines, which, though they may sometimes succeed, in the manner of most empirical remedies, will often, notwithstanding, miserably disappoint our expectations, or now and then, perhaps, reduce the strength of the patient beyond the possibility of a recovery.

Dr. Sydenham was so fully aware of the danger of purging in this disease, that, although he advises moderate purgatives after the autumnal intermittents, yet he expressly tells us*, that the paroxysms should have ceased intirely, and that the space of a month should have elapsed also, previous to the exhibition of a remedy, which could not even then be rendered safe, unless an opiate was administered after its operation. In another part † of his valuable work, when speaking of this particular evacuation in the same disease, he adds the following remarkable passage

* Sydenhami Opera, p. 98. Lugd. Batav. 1726.

† Page 306.

likewise :

likewise :—“*Vitanda itaque ante omnia*
 “*evacuaciones qualescumque, cum vel*
 “*blandissima catharsis, quinimmo Enema*
 “*de Lacte saccharato in morbi discrimen*
 “*certissime, forte in morbum ipsum*
 “*denuo ægrum conjiciet.*”

IN REMITTING FEVERS, if the Bark is judiciously employed, its efficacy is as remarkable as in intermittents; but it is more necessary in the remittents that evacuations should precede its use; indeed the remissions often prove exceedingly obscure, unless this practice be attended to. The dangerous bilious and putrid fevers of warm climates, which, for the most part, are referred to this division of fever, require a very liberal exhibition of Bark. The practitioners who reside in those countries frequently adopt the most decided and bold plan of practice, with manifest advantages. Finding it dangerous to wait for very obvious remissions, they administer Peruvian Bark, in as large doses as can be rendered acceptable to the stomach, immediately after the evacuation of

of the bile and disordered contents of the *primæ viæ* by means of an emetic or cathartic, or both. When the skin continues hot and dry, it has been found useful to employ the common saline mixture and effervescent draughts; and these appear not only to increase the secretions, when the quantity taken is sufficiently large, but to have a considerable tendency to render the Bark agreeable, and to enable the stomach to retain it. At other times, opiates are indicated, and in some cases the best effects have been experienced from Madeira wine; but the chief dependence is undoubtedly on the free exhibition of the Bark, and often too notwithstanding the imperfect state of remission. Several respectable authorities might be quoted in favour of this practice; but I shall content myself for the present with referring to an account of a dangerous epidemic remitting fever, published in the London Medical Observations*, by the late Dr. Sandiford, a physician of eminence in the

* Vol. iv. p. 316.

island of Barbadoes, who strongly inculcates the propriety of administering the Bark, although the remission should not be evident; observing, that success justified the practice of having recourse to it indiscriminately at any period of the disease.

It cannot be denied, however, that in proportion as the remission is more evident, the greater are the expectations which we form of the remedy in question; for, whatever may be its efficacy at other times, and in other cases, no person can doubt that its greatest value consists in the quality, or power, by which it prevents the return of various periodical affections. On this account it is, that we not only experience its utility in intermitting and remitting fevers, but in many other *anomalous* diseases, which approach so far to the nature of these, as to suffer repeated remissions and exacerbations, and which often yield as certainly, or nearly so, to its proper exhibition; such are, particular cases of
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head-ach*, periodical ophthalmia, tooth-ach, &c.

CONTINUED FEVERS, as they are termed, are supposed by many practitioners not to admit of the use of Peruvian Bark, except in their advanced stages, and when accompanied by symptoms of putrefaction: we shall afterwards find, that authorities are not wanting in favour of the early and free exhibition of this remedy; but it may be proper, in the first place, to make a few inquiries into the nature of these fevers, or rather into their connec-

* I had an opportunity, not long ago, of seeing a woman, turned of twenty years of age, who was feverishly afflicted with head-ach, attended with bilious vomiting and remarkable slowness of pulse. It was suspected to be a case of hydrocephalus, and mercury and several other remedies were employed, but with little advantage. She was seldom free from some degree of uneasiness in the head; but the complaint so evidently suffered remissions and exacerbations, that the Bark in substance was at length prescribed; and I have been informed, by a gentleman who attended more particularly to the progress of the case, that it was soon cured by this remedy.

tion with those which have already been the subjects of consideration.

Some persons have contended, that intermittent, remittent, and continued fevers, are so essentially connected, that they are capable on many occasions of changing into one another; and hence intermittents particularly are said to assume, in some cases, the form of continued fever. As there is great difficulty in ascertaining certainly whether this be the fact or not, the remarks which I have to offer are suggested with diffidence.

That there are many symptoms in common to all fevers, cannot be doubted; but I cannot help believing, that the intermittent is extremely distinct, in its real nature, from the common continued fever.

In all the cases of intermittents which appeared to terminate in continued fevers, that I have had opportunities of observing, there was the greatest reason to suspect the application of contagion. Instances of this kind happen every now and then, for example, in hospitals; but under such circumstances,

cumstances, the continued fever is rather to be considered in the light of a new disease, than that of the one having changed into the other from a natural connexion.

The exciting cause of intermittents, and perhaps the only one, appears pretty clearly to be the effluvia of marshes, commonly termed marsh *miasmata*, which there are no observations, that I am acquainted with, to prove capable of causing continued fevers; for it has never been shewn that these last are more prevalent in situations infested with agues than in others; and on the other hand, the exciting cause of most continued fevers is ascertained to be effluvia of a nature different from the *miasmata*, not having any tendency to produce intermittents*.

But

* The difference in the nature of intermittent and continued fevers is farther proved, by the circumstance, that although remittent and continued fevers both occur not unfrequently in the island of Barbadoes, the intermittent is scarcely ever observed there, unless in patients who carry the disease with them from the neighbouring islands. It is true, that a disorder known there

* But it is not so easy to separate the remittents from continued fevers, or assign the exact causes which favour their production. I must confess, it appears to me, that remitting and continued fevers have a connection considerably greater even than intermittents and remittents; and the reasons on which this opinion is founded are these:—In the first place, every remittent appears at its commencement in form of a continued fever, and many of them go on for several days before the remissions are well marked.—2dly. Every continued fever is in one sense a remittent, always exhibiting, in there by the common term of *fever and ague*, resembles the intermittent in some circumstances, and occasionally requires Peruvian Bark; but it is so essentially different in many of its leading characters, that it is to be considered in a distinct point of view. Dr. Hendy, an ingenious physician of that place, has lately described it under the title of the Glandular Disease; and Mr. Rollo has likewise published some observations on the same subject; but I suspect, that neither the seat of the disease, nor the cause of it, much less a successful method of cure, has hitherto been satisfactorily explained.

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the course of twenty-four hours, some slight remission in the symptoms, although the term remittent is not applied, unless the alteration for the better is greater than is generally observed in this country. An obvious remission probably does not happen in the fevers of cold climates, because the action of heat on the body in warm countries, together with the great accumulation of bile, alters or modifies the action of contagion in some way or other, and particularly by giving rise to such violent symptoms on the first attack, that a remission must speedily follow, or death must be the consequence; on the same principle, I imagine, in the animal œconomy, which operates in violent cases of mania, where a state of tranquillity, or a remission of the symptoms, often succeeds to the fury and ungovernable exertions of a few hours.

If there be any truth then, in the observation, that continued and remitting fevers pass into one another in warm climates, or in fact, that the remittents there are the
continued

continued fevers of this country in a more violent degree, from the circumstances just mentioned; and if the efficacy of Bark be admitted in such remittents, does it not necessarily follow, or at least would it not be highly probable *a priori*, that Bark would be endowed with similar powers, even in the fevers which every day occur to our notice? I mean those of the typhus, or low nervous kind, which are frequent in all large towns and cities, but more especially, I believe, in London and Edinburgh.

The great utility of an emetic, in the beginning of all such fevers, with a view of putting an immediate stop to them, or, when this does not succeed, of rendering the disease milder in its progress, seems established beyond controversy; and the propriety of exhibiting wine freely also, in particular cases, with the occasional use of opiates at night, is sufficiently warranted by experience; but why the Bark should be withheld I have often been at a loss to know. It is now so well ascertained, that this

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remedy may be administered not only with safety, but advantage, in the fevers of warm climates, even before the remission is evident, that I have often lamented that its use was not more generally extended to the fevers which are often extremely obstinate and fatal in this country. This practice is inculcated in the writings of Dr. Clark of Newcastle, Dr. Lettsom, and Dr. Sims; and is successfully enforced by several practitioners that I am acquainted with. It is from an earnest desire, therefore, that it may be more generally adopted, that so much time has been bestowed on the subject. In short, I have been able to discover no objection to the exhibition of Bark, immediately after the stomach and intestines are evacuated by an emetic and purgative, or, where symptoms of debility are present, after the emetic only; costiveness being occasionally prevented by clysters.—In the advanced stage of the disease, when *apthæ*, and other bad symptoms appear, the stomach is often unable to retain the Bark; hence, if not given early, it almost

almost amounts to the same as not prescribing it at all.

The chief objections which have been urged to the use of Bark in continued fevers, are,

1st. That it produces weight and oppression at the stomach, increasing sometimes to nausea and vomiting.

2dly. That it excites purging, or renders the discharges by stool, already inconvenient, still more frequent. And,

3dly. That it increases heat and dryness of the skin, and checks the various secretions.

To the first objection, it may be answered—that the inconveniences complained of, are capable of being obviated by the addition of aromatics, and some of the more grateful distilled waters of the shops; by giving the Bark in smaller quantity, and at longer intervals; or by substituting a decoction or infusion, along with the elixir of vitriol and other remedies, in place of the powder.—The purgative effect of the Bark, which forms the second

objection to its use in fevers, is corrected by joining laudanum, or tincture of japonica, and other astringents, with it; though in some cases of bilious fevers, the greatest advantages are sometimes obtained from the moderate discharges by stool, which it excites in its uncombined state.—The remaining objection appears to have originated from the erroneous opinion, that because Bark restrains morbid and colliquative evacuations, it must also check the natural and salutary discharges*.—This last has never been satisfactorily proved, and should not operate therefore as an obstacle to the use of this valuable remedy, when from other circumstances it is indicated.—Bark would ~~from~~ rather to promote the secretions, when the suppression of them is attended

* Dr. Heberden's Observations, at the end of the first volume of the Medical Transactions, tend strongly to correct this common prejudice concerning the operation of Bark, and his ideas have received the fullest confirmation from the inquiries of other eminent physicians.

with debility. At any rate, there are various means calculated to promote perspiration, the employment of which the Bark does not preclude, such as fomentations to the legs and feet, diluting and acidulated drinks, Spirit Minder. Jul. è camph. &c. but above all, an attention to cleanliness, and to the admission of fresh air.

It may be a question even whether the moderate use of antimonial medicines is incompatible with the Bark. In theory they cannot well be reconciled, nor do they, according to the observations of some practitioners, agree in practice; but this may arise, perhaps, from improper management, or from the too liberal use of antimonials. When symptoms of debility, for instance, are great, it would be imprudent, I imagine, to exhibit nauseating doses of emetic tartar, which have an inevitable tendency to increase debility, as every person who has been subjected to their influence must acknowledge. Wine is rather indicated, at this time, to assist the operation of Bark; but I must confess, that in the beginning

of fevers, where slight inflammatory symptoms are sometimes present, or at least where weakness is not very apparent, I should have no objection to the occasional use of antimonials, at the same time that I would embrace every proper opportunity of administering the Bark freely*; for both antimony and Bark appear to me to be possessed of such efficacy in the removal of fevers, as no theory of fever, nor of the operation of the remedies themselves, can enable us satisfactorily to explain; the difference in their application, however, appearing pretty clearly to be this, that the Bark is applicable to almost every stage of fever, while antimony should be confined to the beginning and earlier stages of it.

But supposing that nothing could be discovered in the operation of Bark, which

* It is not my intention, by these remarks, to deny that fevers of a truly inflammatory nature do now and then occur, requiring evacuations for several days, and which would be aggravated by the Bark. My observations are intended to apply to the cases which are of the most frequent occurrence.

its tonic power does not enable us to understand (for I most readily allow it to be an excellent tonic or strengthener, though I consider such power inadequate to the explanation of its action in the cure of intermittents); I say, would it not from this alone appear to be strongly indicated, in continued fevers of the typhus or low nervous kind, where there are symptoms of an unequal determination of blood, the consequence of debility? Thus we find in some cases the eyes red, and the countenance flushed, while a diminished state of circulation in other parts is manifested by the paleness and coldness of the extremities.—Bark then, by increasing tone, and thereby rendering the circulation more uniform (for which purpose it is employed on a variety of other occasions) may on this principle alone, with such as deny it any thing of a specific quality, or flatter themselves that they understand its operation, be expected to prove serviceable. And, what is highly worthy of attention, it would seem that this remedy may be employed with ad-

vantage in this and similar cases, at the same time that recourse is had to topical bleeding, to relieve the accumulation of blood in the vessels of any particular part. Such instances have really occurred to my notice; but I shall endeavour to illustrate the principle, on which this practice depends, more fully, when the subjects of rheumatism and scrophula are considered.

After all the remarks which have been made in favour of the early administration of Peruvian Bark, in the fevers which I have treated of, it is not my wish to be understood, that many other remedies not yet mentioned, which have been recommended by men of eminence, are by any means to be excluded. I am certain, that cases occasionally occur in practice, in which the dislike to the Bark is so great, that it cannot be employed in any other form than that of clyster; and it unfortunately happens now and then also, that patients have so great a loathing to every thing which can be contrived, either in form of drink or medicine, that it is necessary frequently

is particularly required. 201

to change both : at other times, for reasons not easily ascertained, the Bark alone, though retained on the stomach, does not seem sufficient for the purposes of a cure ; hence infusions and decoctions of *serpentaria* and *contrayerva**, and in cases of great languor and debility, *camphor*, *asa-fætida*, *vol. alk.*, *conf. card.*, *musk*, blisters, and the free exhibition of good wine, have all been found extremely useful. But, admitting the utility of these in the full extent, may we not presume, that although indicated, we should in general obtain advantages still greater, in proportion to the quantity of Bark which can be retained on

* The *infusum alexeterium* of the Pharmacopœia of Guy's Hospital, employed there for many years with good effects in fevers of debility, is prepared in the following manner :

℞ Rad. *contrayervæ*,

---- *serpentariæ Virginianæ*, singularum drachmas duas,

Aquæ bullientis, uncias duodecim.

Macera per bihorium, et *colaturæ* adde aq. *pip. Jamaicen.* uncias quatuor, et *syrupi simplicis* unciam unam. *Dosis* cochlearia quatuor sextis horis.

the

the stomach at the same time ; and that we should never therefore desert it, until it has been tried in every form which the elegance and propriety of prescription can dictate?—Thus *serpentaria* is said greatly to improve the Bark by several eminent physicians. Sir John Pringle recommends it along with the decoction of this remedy* ; and it enters likewise into the very elegant tincture contrived by the celebrated Dr. Huxham.—In cases of symptomatic hæmorrhage too, with apparent tendency to putrefaction, the elixir of vitriol forms a valuable addition to Peruvian Bark, and is strongly recommended by the most eminent physicians.

Whenever Bark is judged proper, it should be administered chiefly, if not entirely through the day, not only to prevent, if possible, the evening exacerbation, which may be considered in the light almost of a fresh paroxysm, but because it is highly distressing to the sick to be disturbed dur-

* See Army Diseases, p. 277.

ing the night with medicines. To rouse a patient from a sound and refreshing sleep, indeed, in order to exhibit a draught or bolus, is scarcely admissible under any disease that I am acquainted with, but in fevers, more particularly, it is an act of violence, for which no remedy can be expected to compensate.

With a view of illustrating what I have ventured to suggest on the subject of continued fever, I must beg leave to insert, in this place, an extract from a letter written by my friend Dr. Farre (whom I have already mentioned in this treatise), giving an account of a dangerous epidemic fever that occurred some time ago in the island of Barbadoes.—After describing the symptoms, and plan of treatment, which succeeded at the commencement of the epidemic, the latter consisting of moderate evacuations, saline medicines, and the Bark under circumstances of remission, he proceeds in the following manner:—" This
" practice answered very well at first, but
" as the weather became warmer, and the
" face

“ face of the disorder changed, I was
 “ obliged to alter my method. Saline me-
 “ dicines would by no means agree, nor
 “ could I wait for a remission of fever, but
 “ was under an absolute necessity, on the
 “ first attack of the disease, to blister the
 “ head, and *immediately exhibit the Bark very*
 “ *freely*, with musk and camphor between
 “ whiles, or, what I found answer much
 “ better, a strong solution of asafœtida in
 “ an infusion of valerian and snake-root.
 “ —Opiates at night, to procure rest, were
 “ indispensably necessary, and I found the
 “ warmer ones, as the conf. damocr. an-
 “ swer best.”

The few additional remarks which I
 have to offer on the subject of continued
 fevers, are with regard to the state of con-
 valescence from fever, and the *prophylaxis*
 in general. As the fevers of one season, or
 epidemic, are often accompanied with some
 peculiar symptom not met with in others;
 as they are at one time highly dangerous,
 at another favourable in their termination,
 from causes difficult to ascertain; so it
 sometimes

sometimes happens, for reasons equally obscure, that patients recover health and strength with remarkable rapidity; while, on other occasions, the recovery is so slow, that they remain weeks or months before they enjoy any tolerable state of health, being affected with want of appetite, sickness, tendency to syncope, and profuse sweats; now and then terminating in hectic fever or *phthisis pulmonalis*.

Sir John Pringle had opportunities of remarking this slow recovery in many cases of the jail fever, and although he attempts to assign the reason why this should sometimes happen, yet he confesses that it could not always be accounted for*. Under such circumstances, I should apprehend that the greatest advantages are to be expected from the Bark, either alone, or with elixir of vitriol and wine, assisted by good air, a light nourishing diet, and gentle exercise.

We have the respectable authority of the author just mentioned also, in treating of

* Army Diseases, p. 285.

the same subject, to affirm, that Bark is not only the chief strengthener in such cases, but the surest preservative against a relapse. Those too, who have not previously been attacked with fever, but who are in situations where it is prevalent, would certainly do right, I conceive, in addition to other necessary cautions, to take occasionally a moderate quantity of Bark and wine.

These remarks apply in their fullest extent to intermittents likewise, which not uncommonly return after a short time, when a proper perseverance in the use of the Bark has been neglected. I am persuaded that it is necessary, in general, to continue it a week or ten days after the paroxysms have ceased, in order to secure against a relapse.

Besides fevers, strictly so called, there are other acute and febrile diseases, to which this remedy is applicable; such as the malignant angina, rheumatism, some cases of erysipelatous fever, particular forms of dysentery, small-pox, &c.; each of which I shall proceed to consider, in the order just enumerated.

C H A P. II.

Of the malignant Angina, or putrid ulcerated Sore-Throat.

THIS fatal disease has been so accurately described by Drs. Fothergill and Huxham, that it would be superfluous to attempt, in this place, an enumeration of the symptoms which more particularly characterize it. It is to be feared, however, that practitioners do not sufficiently distinguish this affection from sore-throats of a different nature.

Whenever a child is seized with any uneasiness about the throat, the malignant angina is immediately suspected; and if, on examination, the *fauces* and neighbouring parts appear somewhat inflamed, with slight exsudations of *coagulable lymph*, in form of white specks (supposed to be ulcerations), the notion of the disorder is confirmed; and Bark and wine, with a variety of cordials and stimulants, are prescribed,

scribed, to the great detriment of the patient.

The observations of Dr. Saunders* on this subject, and the inquiries which I have made at different times, all tend to convince me, that the true malignant angina is by no means so frequent a disease in England as is generally imagined; many, even of the epidemic sore-throats, being of an inflammatory nature, requiring moderate evacuations, rather than the cordial and stimulating plan of practice.

I am ready to believe, that the method of treatment just mentioned has been fairly suspected of inducing a fatal termination in some particular cases, by causing an increase of the inflammation along the surface of the mucous membrane of the trachea, in form of the true croup, or angina trachealis †.

But

* Page 72 of the Treatise on the superior efficacy of the red Bark.

† I cannot propose, in this Essay, to enter into an examination of the very extensive question, how far the *scarlatina* and malignant angina are different diseases,

But as the putrid fore-throat does occasionally occur, and as, during its presence, evacuations are, for the most part, highly prejudicial, the greatest circumspection is necessary, lest, in avoiding one extreme, we should run into another, and, by the indiscriminate use of evacuations, give rise to greater inconveniences, perhaps, than result now, even from the ill-judged employment of Bark and wine. On some occasions, I can readily conceive that it will be very difficult to establish the dis-

eases, or modifications of the same disease. If the reader wishes to examine the arguments in favour of the one, or of the other opinion, he will find them stated in the Treatises of Drs. Withering and Clark, and in Dr. Cullen's First Lines of the Practice of Physic.

For my own part, I cannot help considering them distinct diseases; for, admitting that *scarlatina* occasionally occurs with symptoms of debility, requiring the free exhibition of Bark; it is, notwithstanding, allowed by most practitioners, that this kind of fore-throat often requires evacuations, and may be intirely removed without the assistance of Bark; which does not appear ever to be the case in the angina maligna.

P tinction;

tion; nor can I point out, in a decided manner, the circumstances which should lead in general either to the one or the other mode of treatment.

When well-marked inflammatory symptoms are present, or the opposite of these, appearances of considerable debility in the system, with a tendency to gangrene in the throat, pointed out by dark-coloured spots, &c. then there can be no difficulty in determining the point; but when the symptoms are of a moderate kind, and especially if both the diseases be prevalent during the same season, which, I believe, sometimes happens, it is almost impossible to say whether the affection will prove in its progress to be the *angina maligna*, or the *erysipelatoſa*.

These are the cases which appear to me to require the greatest caution, and the strictest and most accurate observation with regard to the effect of remedies, which then become the surest, if not the only means of determining the real nature of the complaint:—thus, if on the exhibition

tion of Bark and wine the symptoms are aggravated, and more especially if a difficulty of breathing immediately supervenes, with increased heat and strength of the pulse, we should surely desert these remedies, and have recourse directly to the opposite plan of treatment; and if, on the other hand, evacuations be first employed, and seem to increase the complaint, we have the best grounds for proceeding in the use of Bark and cordials.

But whatever may be the case in this or other countries, it is certain that the malignant fore-throat is a very frequent disease in the West Indies; though I cannot help thinking, that even there it is sometimes confounded with fore-throats of an erysipelatous and inflammatory kind, and with some particular modifications of croup*.

P 2

If,

* I have said modifications of croup, intending to signify, that although the peculiar symptoms of inflammation in the trachea are often attended with appearances of increased action in the system, requiring the
free

If, however, the presence of the malignant fore-throat be once ascertained, there can be no doubt of the propriety of employing Bark as freely as it can be administered. I have often been a witness, in the island of Barbadoes, to its great efficacy; but have frequently lamented the difficulty of prevailing on children to swallow it in the necessary quantity. We are particularly called upon, under such circumstances, to contrive a variety of the most agreeable *formulae*; to exhibit the extract of Bark in the manner formerly mentioned; and to have recourse to Bark clysters frequently repeated.

Dr. Fothergill advises two or three drachms of Bark in fine powder, with three

free use of the lancet, yet that this does not seem necessarily to be the case; for that an inflammation of this part may occur in a debilitated habit, so as only to bear topical evacuations. The observations which are soon to follow will readily explain why this affection should be sometimes mistaken for the putrid fore-throat, especially as they appear, on particular occasions, to be complicated with each other.

or four ounces of broth, to be injected every six hours, adding a small quantity of the *elect. è scord.* to each, if discharged too speedily; by which method he thought he had saved many children, when not a drop of medicine, and scarcely any kind of nourishment, could be swallowed*. When, however, a troublesome diarrhœa attends the disease, I am pretty certain that the Bark in powder does not answer. In place, therefore, of the form recommended by Dr. Fothergill, when it cannot be retained any length of time, or increases the diarrhœa, I would prefer one drachm of the extract of Bark carefully triturated with a few ounces of milk, or thin jelly of starch, with from five to ten or fifteen drops of laudanum.

At the same time, notwithstanding that the fullest justice is done to the Bark, let it not be supposed that it is in general adequate alone to the removal of this formi-

* See Preface to the 5th edition of his Account of the putrid Sore-Throat, page vi.

dable disease. Melancholy experience has convinced most of the inhabitants of the island which I have mentioned, that the contrary is the truth, and that, although the Bark be freely administered, and retained on the stomach, the disorder often terminates fatally, under the direction of the most experienced and sensible of the profession. So great indeed is its fatality, that many families have been deprived, in a few weeks, of a numerous and promising offspring; while the practitioner, in addition to the common feelings of humanity, is embarrassed and perplexed with the uncandid suggestions of the uninformed multitude, at a time when he has, probably, to the utmost, complied with every direction, furnished by the present stock of knowledge, and which could not have been more successfully applied by any of his neighbours.

For these reasons, I have bestowed much attention, for some time past, in investigating the nature of the disease, by collecting the cases of it, which I had opportunities

tunities of attending to during my residence in Barbadoes; and by comparing them with the accounts of the different authors who have written on the same, or on similar diseases, with a view of ascertaining whence it could arise, that the Bark, though sometimes an effectual remedy, should not still more frequently produce the desired effect.—These inquiries have led me to form some conclusions, which I shall submit to the candid examination of the reader; hoping that they may either be confirmed or refuted by actual observation. From the fair trial of the means which I shall propose, no inconveniences, I apprehend, can arise; and if their utility be established, a valuable acquisition will be made to the method of treating this fatal disease.

I have had an earnest desire, from the time that this disorder became an object of serious consideration with me, of obtaining a knowledge of the appearances, upon dissection, of those who die of it, in order to form some certain conclusion of the

manner in which death is produced: but, as no favourable opportunity of acquiring such information has occurred to me, I must rest satisfied, for the present, in illustrating my ideas, by referring to the symptoms which occur in the progress of the disease, and by having recourse to the phenomena which have been found on the examination of bodies on dissection, that exhibited, during life, symptoms somewhat similar.

In the first place, then, I would observe, that I have seen patients die of the angina maligna, in whom the symptoms of debility and putrefaction were by no means considerable, and where, from the symptoms of suffocation, death was rather to be ascribed to some cause producing an obstruction to the free admission of air into the lungs*. And even where the symptoms

* This is fully confirmed by the following passage from Dr. Fothergill:—"Some had an extreme difficulty of breathing almost from the first; some had a violent cough; some were comatous; others had a delirium;

symptoms of debility are more remarkable, the impediment to respiration, from some obstructing cause, is still observable. This has seldom escaped the observation of those who have been familiar with the disease; hence the term *Garrotillo* by the Spaniards, and that of *Morbus Strangulatorius* by other nations.

By different persons, the suffocation has been attributed, either, to the ulceration and gangrene extending into the trachea; to the acrid matter generated in the throat getting admission there; or, according to Dr. Cullen, the larynx and trachea are often affected in the same manner as in the *Cynanche Trachealis*, or croup; though he thinks there is reason to suspect, that dissectors have not always distinguished pro-

“ a delirium; some died in a lethargic stupor; others
“ bled to death at the nose; whilst others again had
“ none of these symptoms, but were carried off suddenly by an *instantaneous suffocation*.” See Fothergill’s Account of the putrid Sore-Throat, 5th edition, p. 15.

perly

perly between the two diseases*. I have not been able to find that these different conjectures (for they do not deserve a better name, since the examinations after death have been by no means frequent or accurate) have led to any improvement in the practice, or to the suggestion of remedies calculated to co-operate with the Bark in subduing this fatal disease.

Upon a careful review of the various disorders which terminate fatally, by affecting the organs of respiration, it appears to me, that the immediate cause of death in several is to be attributed rather to some spasmodic affection about the glottis, than to the obstruction produced by the presence of any foreign or adventitious substance in the trachea.

This idea first occurred to me, in consequence of the dissection of a man affected with *lues venerea*, who evidently died suffocated. On examination, I perceived

* See First Lines of the Practice of Physic, vol. i. p. 289, last edition.

that

that the larynx was much ulcerated, but in such a manner, that the cavity, so far from being narrowed, was evidently increased in its dimensions; hence it was impossible to account for death in any other way, than by supposing that the irritation, arising from the ulcerated part, had occasioned a spasmodic constriction of the muscles about the glottis. This opinion was confirmed by attending to the phenomena of the croup, and to the appearances on dissection in this disease; for, in many instances, the membrane of coagulable lymph found in the trachea, has been so exceedingly thin, as scarcely to affect the size of the tube; and I have received the most decided information, that patients have been carried off with all the symptoms of croup, in whom no adventitious membrane at all could be found.—To what, then, are we to attribute death on such occasions? Is it not sometimes to be sought for in spasm alone? and, at other times, supposing the coagulable lymph present, are we not in part to ascribe the
stoppage

stoppage of respiration to the spasmodic affection-also? This is rendered highly probable, not only by dissection, but by the remedies which have been productive of very essential benefit; for, however fully the practice of bleeding and other evacuations may be confirmed in the beginning of croup, the utility of antispasmodic remedies, in the more advanced stages of it, is equally apparent.

The application of these remarks to the subject of consideration will, I trust, be obvious. In short, it appears to me, that the irritation, occasioned by the ulceration in the pharynx and œsophagus, and perhaps in the larynx itself, gives rise to the spasmodic affection before mentioned; and consequently, that the fatal termination of the malignant angina is in general to be attributed to the same cause as that of the croup.

But to what, it may be asked, does all this tend? In my mind, it leads to the free use of antispasmodic medicines along with the Bark.—All that can be expected from

this excellent remedy is, to subdue the debility and tendency to putrefaction, and to induce a favourable condition in the ulcers; just as mercury would have done in time, with regard to the case of Syphilis that I have related. In both instances, however, the necessity of some additional remedy, for the removal of an urgent symptom, is obvious; the action of Bark, as well as mercury, being slow in most diseases. On this account, I must confess, that, besides Bark, wine, and the various cordials and antiseptics usually employed in the putrid fore-throat, I should have recourse to the free exhibition of asafœtida, and to a trial of opium, in addition to the proper employment of gentle emetics, and blisters to the throat, with the cautious application, likewise, of antiseptic gargarisms and injections to the fauces.— If these last are not managed with the greatest care, there is reason to suspect that the spasmodic constriction will be considerably increased, in consequence of the violent

violent agitation of crying, which they frequently excite.

With regard to the *asafœtida*, which is undoubtedly a powerful antispasmodic, I had an opportunity of experiencing the best effects from a solution of it before I left Barbadoes, in a case of sore-throat, apparently desperate; as Bark and other remedies had received the fullest trial, without the slightest alleviation to the symptoms. A blister, indeed, was applied to the throat at the same time, and to this I could not but attribute much of the relief which was experienced in the course of twenty-four hours; but, as the difficulty of breathing continued severe, and mended gradually under the use of the *asafœtida*, it is fair to allow to its operation a good part of the advantages which were obtained.

To young children, who may not always be prevailed on to take the *asafœtida*, I would propose administering it in form of clyster, so as to alternate injections of this

this kind with those consisting of the Bark.

If *asafœtida* be serviceable, and if too in consequence of its antispasmodic powers, it is natural to expect that opium, which is one of the most powerful of this class of remedies, would likewise be productive of good effects; and it possesses this very striking advantage, that it can be administered without any difficulty to children.

Another view may also be taken of opium, not less favourable to its exhibition in this disease. In a variety of instances, it has been found to assist in the removal of disorders, in which Bark is indicated, but in none more than in many cases of gangrene. Now, as the tendency to putrefaction is often great in the angina maligna, and as in the throat more especially the gangrene is preceded by some degree of inflammation and irritation, may not opium deserve a trial on this principle, as well as on the other? I must own, however, that I should place the greatest confidence in its antispasmodic powers. — But there is still

still another advantage possessed by opium, which is exceedingly striking. Dr. Fothergill has remarked, that a diarrhœa is often one of the most troublesome symptoms in the putrid sore-throat; for the relief of which we certainly could not have recourse to a more effectual remedy; whereas *asafœtida*, having, on the contrary, a tendency, in many instances, to produce a purgative effect, could not with propriety be employed when this condition was already present, unless accompanied by opium.

From a combination of these remedies, greater advantages may be expected, than from either of them separately; for it undoubtedly happens with antispasmodic as with many other remedies, that effects are often perceived from a judicious mixture, which could not have been obtained from the articles in their separate state; and thus, with respect to *asafœtida* and opium, it is probable, that while the antispasmodic power would be improved by their union, they would mutually correct in each other those

those qualities which might prove injurious. Opium, for example, is excellently calculated to restrain the purgative effect of *afascetida*; while this, in its turn, by supporting a free expectoration, bids fair to prevent any inconveniences that may be apprehended from opium alone, which has in general a remarkable tendency to diminish the discharge just mentioned; the continuance of which is to be considered favourable in many instances of this disease.

In this manner have I endeavoured to suggest, why Peruvian Bark alone should not more frequently prove effectual in the cure of this dreadful disorder, and have attempted to point out the means which appear best calculated to co-operate with it, and secure its efficacy.—I wish that greater experience would allow me to speak with confidence of the success of this mode of treatment. It is true, that many of the useful remedies which are employed in medicine, have been more the result of chance, than of any previous theory on the nature

of the disease; but, as this has not always been the case, and as great improvements have likewise been introduced, in the treatment of particular diseases, by reasoning on the structure and functions of the body, and by being acquainted with the obvious effects of certain remedies in other diseased conditions, I cannot help flattering myself, that the method which has been proposed, deserves to be put to the trial. If, upon a fair examination, it should not be found to lead to practical utility, I will most readily relinquish it, being convinced how necessary it is to the promotion of truth and science, that theory should constantly be made subservient to experience.—My recommendation of *asafœtida*, however, in this disease, does not intirely rest upon a theoretical foundation. One case has been related, in which good effects were experienced from it, and at a period when I adopted the use of it more from accident, than from any reasoning on the nature of the disease. The advantages, indeed, obtained from it in this, and in some

other affections of the organs of respiration, assisted me in forming the explanation which I have delivered, of the manner in which the fatal termination, in the malignant angina, is induced.

I have not been able to find, in the course of reading, that either asafoetida or opium has been hitherto mentioned, as having been tried in this disease, only that Dr. Fothergill recommends the latter for restraining diarrhœa and dangerous hæmorrhages when they occur; but in no part of his treatise, as far as I have been able to perceive, does he in any degree consider the manner in which the suffocation is produced, or advise any method of relieving it.

C H A P. III.

Of Rheumatism.

THIS disease is commonly divided into two species, the acute and chronic; the term acute being employed

to denote that which is attended with fever or manifest inflammation of the joints, or with both; while by the chronic rheumatism is generally understood, that which is free from either of the conditions just mentioned, but which is characterised chiefly by pain in one or more of the joints of the body.—In the former species, various evacuant remedies, and the antiphlogistic plan of treatment, are recommended; and in the latter, the use of warm and stimulating medicines is, for the most part, inculcated.

It appears to me, that this division is insufficient, as it neither satisfactorily comprehends the phenomena of the disease, nor the most successful method of cure. The variety of symptoms, which seem to point out a farther distinction, shall be soon enumerated; but in the first place it may be proper to examine the success which results from the treatment most commonly adopted.

Every candid practitioner will be ready to allow, that there is scarcely a more obstinate

stinate disease than acute rheumatism; for in a great number of instances it so completely resists bleeding, and every other evacuation, that at the end even of the fourth or fifth week, the unhappy sufferer finds that he must acquire a stock of patience, probably for several weeks longer; and in addition to this, there is a chance of his being subjected, in a short space of time, to a relapse. On the contrary, it must be admitted, that in certain other instances the disease is speedily subdued by the same practice. But, since the proportion of unsuccessful cases is far more considerable than the others, does it not prove that there is a manifest defect, either in the ideas which are formed of the complaint, or in the medicines which are employed? Is it not a matter of surprise then, that more attention has not been bestowed in discriminating the cases, to which the antiphlogistic plan of cure is more especially adapted; and in suggesting remedies of a different kind, for those forms or stages of

the disorder which seem to be increased by the same method of treatment?

Patients afflicted with acute rheumatism, frequently become extremely solicitous with regard to their situation. They either cease to have any degree of confidence in the physician, and apply to another for relief, or, if the reputation of the physician be sufficiently established, they acquire a disgust to physic itself, and consider it altogether inadequate to the ends which it is proposed to fulfil. These circumstances, disagreeable as they are to the persons concerned, and injurious as they must undoubtedly prove to the real advancement of medicine, have seldom produced a proper effect. The same practitioner, who but a few months before had occasion to regret the inefficacy of his endeavours to combat the disease, meeting with another instance of the same kind, treads exactly in the old path, and, because he perceives symptoms of fever or inflammation, considers evacuations indispensably necessary, at a time when the constitution of the patient, or some disease from
which

which he has previously suffered, renders the success of them extremely doubtful.

It is not my intention to suggest, that no person has been aware of the inefficacy of the antiphlogistic regimen on many occasions in acute rheumatism, or that no method of a different kind has been recommended. I regret, most sincerely, that the observations which have been made at different times, have not been rendered more subservient to utility, though, on the whole, I shall endeavour to place the subject in a fuller and clearer point of view than any which I have hitherto met with.

Dr. Saunders, in his Treatise on the Red Peruvian Bark, has attempted to inculcate the use of that remedy, and of Bark in general, in the disease under consideration. He observes, that the acute rheumatism, notwithstanding its inflammatory attack, and the appearance of the blood, and although the joints often continue inflamed several weeks, very early assumes the form of remitting fever; and that, finding a perseverance in the an-

Q4 antiphlogistic

tiphlogistic plan ineffectual under such circumstances, he had several times employed a cold infusion of the red Bark, and that the disease seemed only to give way to this treatment. He is likewise disposed to believe that rheumatism is to be considered in the light of an intermittent fever in a state of disguise; but, at the same time that he recommends the use of Peruvian Bark, he admits the propriety of having recourse to moderate evacuations, and to plentiful dilution in the beginning of the disease.

I have observed also, in the third volume of the *Thesaurus Medicus*, lately published at Edinburgh, that the Bark is advised with a similar view. The author, after treating of the use of this remedy in intermittent fevers, proceeds thus, “ Iisdem
 “ tempestatibus, quibus febres intermit-
 “ tentes, rheumaticæ etiam sæpè simulque
 “ grassantur, et haud rarò leviores periodi-
 “ cum induunt typum: has perinde, quum
 “ cortice curari oportet, ratione prius ad
 “ phlogistici sanguinis diathesin habitâ,
 “ legibus iisdem, quibus intermittentes,

“neceſſe eſt ſubjicere. Et hîc, etiam, de
“hemicrania periodica pertinet mentio-
“nem brevi facere; de rheumatismo odon-
“talgico; dolore iſchiadico; aliisque ejus-
“modi doloribus, diverſas corporis partes
“excruciantibus; qui, quoniam et inter-
“mittentis non rarò quoque faciem, quo-
“tidianæ præſertim, æmulantur, topici
“intermittentes dici ſolent*.”

Sir John Pringle alſo mentions the uſe of Peruvian Bark in this diſorder. He obſerves, that ſome phyſicians had ventured to give the Bark in acute rheumatism, after plentiful bleeding, as ſoon as a ſediment appeared in the urine, although ſome degree of fever remained, and the pains were ſtill conſiderable; and that he had experienced ſome ſucceſs himſelf, in giving it thus early, but that he had not ſeen caſes enough to recommend the practice to others†.

* Vide Theſaur. Med. Edin. Tom. iii. Diſſertat. de Cinchona Officinali, auctore Rich. Pultney, p. 22.

† See Pringle's Diſeaſes of the Army, third edition, p. 157, note.

During

During my residence at Guy's Hospital, I had opportunities; at different times, of seeing very excellent effects from Peruvian Bark, administered in cases of acute rheumatism, according to Dr. Saunders's directions; and the Dr. has been kind enough to inform me lately, that every day's experience has confirmed him in the propriety of this practice. Having seen one or two cases myself, however, and having heard of others, in which the same advantages were not obtained from it, I think it particularly necessary to point out that form or stage of the disease to which it is more especially adapted.

Although the observations which have been mentioned, concerning the tendency to a remission in this disease, and the inference which has been drawn from thence in favour of the Bark, may apply to many cases of the disease; yet, as there are some in which this remedy may be proper even when a remission is not evident, and others where it would be likely to prove hurtful, were we influenced by the circumstances of
remission

remission alone, I shall attempt a distinction which appears less liable to error.

Persons of the most robust constitutions are occasionally seized with swelling and inflammation of the joints, after exposure to cold, attended with symptoms of fever, with a full and strong pulse, white tongue, and costiveness. This may with justice be denominated the true acute inflammatory rheumatism, requiring plentiful evacuations, and liable to be increased by the exhibition of Bark, unless in its advanced stage, or after the free use of the lancet, antimonials, and diluents.

But, on the other hand, it is not uncommon to find persons of delicate and irritable constitutions, attacked indeed with swelling and inflammation of the joints, but not with symptoms of general increased action in the system; for although the skin be hot, and the pulse quick, the delicacy and weakness of the body clearly point out the impropriety of having recourse to the antiphlogistic plan of practice. I have frequently known patients affected with
this

this form of rheumatism, who had either scarcely recovered from a tedious attack of the low nervous fever, had just completed a long and dreadful course of salivation, or had been severely affected with hysteria. In all these situations, no person could doubt that these patients were affected with great debility, and yet the disease certainly acute, fever and inflammation making a part of it; but the constitution so different, and the kind of fever likewise so opposite to that of the other form of the disease, which I have described, that it is as necessary to distinguish these from one another, as to point out the distinction between both of them and chronic rheumatism.

For these reasons, I beg leave to hint at the propriety of dividing acute rheumatism into two species; the first being that attended with phlogistic diathesis, requiring general evacuations and the antiphlogistic regimen, and which may be called the *true inflammatory rheumatism*; while by the second species of the acute form of the disease,

disease, I would understand that, which, in addition to topical inflammation, exhibits symptoms of debility and irritability in the whole system, and which may be termed *acute rheumatism with irritability*, or the *irritable species of the disease*. In this last, the topical evacuation of bleeding by leeches is often serviceable, and gentle diaphoretics may be proper when the skin is hot and dry; but I apprehend it is that state of disease, in which the Bark cannot be given too early, or perhaps too freely, provided it can be retained on the stomach.

It is not improbable, that the true inflammatory rheumatism, when it has continued a fortnight or more, and particularly if the patient has been freely evacuated, may be reduced to the irritable form of the disease, and then undoubtedly the Bark may be expected to prove useful, on the same principle which directs us in the employment of it, at other times, on the first attack of the complaint.

There are many, who will, perhaps, be
ready

ready to object to the foregoing division of rheumatism, as unnecessary. They may contend, that the circumstances which have been mentioned, indicate a difference in the degree of the disease only, and not in the species; and I must confess, that if the propriety of the practice be admitted, and the different degrees carefully attended to, it is a matter of little consequence whether they be considered different degrees, stages, or species of the disorder. I have been the more ready to make them distinct species, that a striking recollection should remain on the minds of my readers, for the benefit of the unhappy sufferers who are afflicted with rheumatism: besides, if the symptoms pointed out a difference in degree only, Bark, in a greater or less quantity, should always be safe, if not serviceable; the contrary of which appears to be the case.

Nothing is more frequent than inflammation in different parts of the body, at a time when the whole system is in a state of debility; and it is strictly rational, when
such

such a connection is perceived, that we should have recourse to topical evacuations, although Peruvian Bark and other remedies are employed to support the vigour of the body; hence, in treating of fevers, notice was taken of the necessity of drawing blood from the temples, at the same time that it was proper to administer Bark freely. The same thing happens in many cases of scrophula, to be mentioned more fully hereafter; and it is exactly on the same principle that this practice obtains in the irritable form of rheumatism; examples of all which I have seen sufficiently often to convince me, that the application of this doctrine, in the treatment of diseases, is of great extent and importance. It should seem in these cases, that debility, by favouring an unequal determination of blood, tends greatly to support the state of action and inflammation in particular parts, and, in proportion as this debility is increased by general evacuations, the disease is rather confirmed than removed.

Peruvian

Peruvian Bark has often been employed in chronic rheumatism, and has occasionally been productive of good effects; but the state of torpor which accompanies it, often requires the more stimulating operation of gum guaiac., vol. alk., electricity, mercury, and blisters.

C H A P. IV.

Of the Use of Bark in erysipelatous Fever, Dysentery, Small Pox, &c.

ERYSIPELAS varies considerably in its nature and appearance, being at one time intirely a topical affection, and mild; at another, rapid in its progress, and liable to terminate in gangrene; sometimes attended with fever of an inflammatory kind, and on other occasions with a fever of extreme debility and malignancy.

At present, the more general affections are to be considered; the variety of which, however, I shall not attempt to explain, as it does not appear to me to depend on any difference

difference, either of climate or constitution, which we are capable of understanding. In some places, it almost always appears under the inflammatory form, or that of general increased action; while in others, it as constantly assumes the appearance of debility; but no difference in such situations has ever yet been ascertained, sufficient to explain on what the variety depends. It only remains, therefore, that we should be careful in distinguishing the cases to which the antiphlogistic plan of treatment is applicable, from those which demand an opposite method of cure.

If Erysipelas be attended with a quick and weak pulse, and with symptoms of languor and depression, Peruvian Bark should be administered with the greatest freedom; and wine, with various cordials and aromatics, is sometimes required at the same time. I have seen several cases of this disease, in which the inflammation occupied the whole of the head and face, successfully treated in this manner, even when accompanied with stupor, and a re-

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markable

markable sinking of the *vis vitæ*. I have, more than once, likewise, observed good effects from a blister to the neck, when the head was much affected, at the same time that the internal remedies, which have been mentioned, were freely employed.

Bark with lime-water is said by some physicians to be more effectual in erysipelas, especially in that form of it which attacks patients with lues venerea, who have undergone a course of mercury, than when administered alone.

DYSENTERY, as well as Erysipelas, assumes a great variety of appearances, but it is not so difficult to understand them; for, however much the situation may vary, if a healthy and robust person be attacked with the disorder, the symptoms, in the beginning, are almost invariably of an inflammatory nature; while in those exhausted by previous diseases, or who are naturally of weakly and delicate constitutions, the very reverse happens; the symp-

toms

is particularly required. 243

toms being characteristic of debility, from the first attack of the disorder.

I have had frequent opportunities of seeing this disease among the negroes in the West Indies, where it often appears with so great a degree of debility and malignancy, that a liberal exhibition of Bark and wine, with remedies of that nature, are required at a very early period of the disease; for, if evacuations are not managed with the greatest care, a fatal termination may be readily induced, or brought on much sooner than it would otherwise have happened. It is sometimes necessary, immediately after the exhibition of a gentle emetic and cathartic, to have recourse to the Bark, along with cascarilla, serpentaria, &c. and to the occasional use of opiates, particularly at night. These should always be assisted by a careful regulation of diet, the most proper articles of which are, in general, thin jelly of starch, sago, and other mild, mucilaginous substances, carefully prepared.

As Bark in substance can seldom be

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retained

244 DISEASES *wherein* BARK

retained in sufficient quantity, on the stomach, in this disease, it is necessary to contrive strong decoctions of it, with cascarrilla, cinnamon, or fimarouba; sometimes with the tincture of Bark and tincture of japonica; or the extract of Bark may be given along with the extract of logwood; from a proper perseverance in which plan, the best effects have been often experienced.

Dr. Whytt, in a letter to Sir John Pringle, observes, that he had given the Bark successfully, in form of strong decoction, with conf. japonica, and with laudanum at night, when the mouth and alimentary canal were threatened with *apthæ*, and even sometimes after they had appeared*. I have known patients recover from dysentery under the use of Bark and wine, in whom the symptoms were so exceedingly unfavourable as almost to point out a state of actual gangrene in the intestines; hence,

* See Pringle's Diseases of the Army, p. 245, note, 3d edition.

we have good encouragement to persevere in the employment of these remedies, as long as they can be rendered acceptable to the stomach.

In the chronic dysentery, also, the Bark has occasionally proved effectual in strengthening the stomach and intestines, and in preventing a relapse. It may be given in the form of simple infusion, though the preparation of Bark with lime-water is that which seems best adapted to this stage of the complaint.

The utility of Bark in particular forms of SMALL-POX is so generally known, that, to enlarge much on it in this place, would appear a tedious repetition of what has been advanced by other persons, better entitled to decide upon its efficacy in this disease.

Although the use of this remedy in small-pox was hinted at by Dr. Morton, yet it is certainly to the observations of the late Dr. Monro*, that we are chiefly

* Vide Edinburgh Med. Essays, vol. v. p. 102, &c.

indebted for the admirable effects which are experienced from it, in promoting the suppuration, and in diminishing the fever, in the more unfavourable cases of the disorder. Since the time of Dr. Monro, this practice has received the most ample confirmation, from many physicians of the greatest eminence; so that, at this day, no person hesitates to prescribe the Bark, whenever symptoms of debility make their appearance, especially when the pulse is quick and weak, the pustules flat and not disposed to purulency; when the hands and feet do not swell at the usual time, and when the pustules are not surrounded by a proper degree of redness and action in the vessels. It becomes still more necessary to have recourse to it freely, along with wine and elixir of vitriol, when petechiæ, dark-coloured spots, or hæmorrhages, happen to be joined with the disease.

In all these states of small-pox, Bark is plainly indicated; but there are others, also, where it is often necessary, and where practitioners

practitioners do not generally employ it;—thus, we sometimes meet with cases of the natural disease, with apparently moderate, or even with slight inflammatory symptoms, undergoing so sudden and unfavourable a change, that there is the greatest difficulty in promoting a recovery. I have several times seen Bark administered with advantage, in cases where the pustules were very numerous, but in which, from the slight inflammatory appearance accompanying them, most practitioners would rather have advised moderate evacuations. These have convinced me, that the tendency in Bark to produce inflammatory symptoms is by no means so great as many have imagined; and that, in doubtful cases of small-pox, particularly if the pulse be quick, and at the same time but of moderate strength, we should, in general, make trial of it, in order to prevent the unfavourable symptoms which have been mentioned.

This is the opinion of Dr. Gregory, at Edinburgh, who, for the most part, prescribes the Bark, with manifest advan-

tages, to a greater extent than any physician I am acquainted with, in the cases of small-pox which are placed under his care in the infirmary of that place.

It will not be improper, I imagine, to add a few remarks on the use of Bark in MEASLES. This is a disease so generally of the true inflammatory kind, that many physicians of extensive practice may never have an opportunity of meeting with a case of it, which would require the exhibition of Peruvian Bark. We should, nevertheless, be on our guard, lest the putrid or malignant form of measles, mentioned by Morton and Huxham, and more particularly described by Dr. Watson*, should make its appearance; in which case, the plan advised by that judicious physician must be adopted. Among other remedies, he experienced very excellent effects from Peruvian Bark, in form of decoction, taken freely, provided the cough

* See London Medical Observations and Inquiries, vol. iv. p. 132, &c.

and difficulty of breathing were moderate; for, in some cases, these symptoms were so much increased by its use, that it became necessary to lay it aside, and to substitute the *radix serpentar. virg.* in its place.

But, independent of this particular form of the disorder, Bark has been recommended at any time when the eruption suddenly recedes from the surface of the body*. I am very doubtful, however, of the propriety of such a practice, unless symptoms of great debility, without any remarkable difficulty of breathing, or pain in the chest, constituted the chief part of the affection; for I recollect to have seen the body of a child examined some time ago, in whom the eruption suddenly disappeared previous to the fatal termination, and in this instance, the signs of inflammation, throughout the whole cavity of the thorax, were so great as to afford a conclusion rather in favour of repeated

* Vide Thesaur. Med. Edin. tom. iii. p. 24.

bleeding

bleeding and blisters, than of Bark and cordials. Some caution will at least be necessary, therefore, in discriminating those cases in which Bark may be expected to prove serviceable.

The eruptive or vesicular disorder, termed PEMPHIGUS by nosologists, though rarely met with, yet as the fever accompanying it, is said, in general, to be attended with symptoms of debility, may be mentioned in this place as requiring the exhibition of Bark likewise.

With regard to the MILIARY ERUPTION, as it seems to be a symptomatic affection, the observations made on the subject of continued fever will sufficiently apply to it; or, if it be ever suspected to be idiopathic, then we are to be regulated in the use of Bark according to the symptoms of debility, as at other times.

C H A P. V.

Of Hæmorrhages.

HAVING already taken notice of the exhibition of Peruvian Bark in the symptomatic hæmorrhages attending malignant fevers and the confluent small-pox, it will be proper, at present, to confine our attention to idiopathic hæmorrhage. This is commonly divided into two species, the active and passive; the former attended with fever and increased velocity of circulation; the latter, with a state of laxity, and debility of the whole body, but more particularly of the part from which the blood flows.

It appears to me, that this division, as well as that of rheumatism, which is generally adopted, is incomplete, and for reasons very similar to those which were explained in treating of that subject. Some cases of hæmorrhage, for example,
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are so truly active and inflammatory, that it is not only necessary to employ evacuations, and the antiphlogistic regimen, at the time of the discharge, but often in the interval likewise, in order to prevent a return. Such a plan of treatment is frequently applicable to hæmorrhages from the nose and lungs, and even occasionally from the uterus; but, on the other hand, discharges of blood attended with heat, quickness of the pulse, and other symptoms of fever, are by no means uncommon in persons of the most delicate and evidently debilitated constitutions. Now, as examples of this kind cannot be referred to the second species, or to passive hæmorrhage, we are obliged to consider them as belonging to the active species of the disease; but so different are the circumstances from those of the true inflammatory hæmorrhage, that, I trust, the necessity of dividing the active form of the disorder into two species or varieties will be obvious, viz. into *febrile and inflammatory* on the

is particularly required. 253

the one hand, and into *febrile and irritable* hæmorrhage on the other.

The advantages attending such a division are these: that although, in the second species of the acute, we ought not to endanger an increase of the discharge, by exciting the action of the vessels by means of stimulants, given with the hopes of obviating debility; yet it would certainly be improper to employ evacuations and the antiphlogistic regimen with that freedom which is necessary in a case of the true inflammatory kind. But the difference in the treatment during the interval is still more remarkable. In the one, a low diet is indicated; in the other, a nourishing diet and Peruvian Bark afford the most promising security against a relapse.

One of the latest and most respectable authors * on the *Materia Medica*, after speaking of the use of Bark in hæmoptysis, as recommended by different phy-

* Vide *Apparatus Medicam.* auctore Jo. And. Murray, tom. i. p. 599.

cians,

cians, adds the following observation:—

“Me judice, verò, Cortex solus non tam
 “præsenti sanguinis effluentis rivo obtu-
 “rando par est, quam robori pulmonibus
 “conciliando, densando sanguini, fluidi
 “nervei ataxiæ sedandæ, et iterato proflu-
 “vio avertendo. Et ad hosce scopos at-
 “tingendos tanto magis idoneus est, quum
 “et febrem coerceat, et spasmodicas af-
 “fectiones, quibus hi ægri obnoxii sunt,
 “sopiat.” He gives the following di-

rections, likewise, concerning the exhibi-
 tion of the Bark:—“Cave igitur mox
 “initio Corticem præbeas, quando febris
 “adhuc valida infestat, vel inflamma-
 “tionis in pulmonibus vestigia ap-
 “parent, quæ potius venæsectione, dilu-
 “entibus, antiphlogisticis, clysmatibus,
 “vel mitioribus laxantibus, quiete corpo-
 “ris et animi, prægressis compescenda.”

This caution, I apprehend, is more ap-
 plicable to hæmorrhage from the lungs
 than to any other, as it is more frequently,
 perhaps, of the true inflammatory nature;
 but I must confess, that, in febrile hæ-
 I
 morrhage,

morrhage, with debility, either from the lungs, or from any other organ, I should not avoid Bark, so much from any apprehension of its doing harm (its stimulant power being very inconsiderable), as from the persuasion that other remedies were at hand more effectual for restraining the discharge. I have several times, for instance, known a pretty large dose of opium speedily answer the desired effect, both in hæmoptoe and in uterine hæmorrhage, apparently by diminishing the force of circulation, and giving an opportunity for the formation of *coagula* at the extremities of the ruptured or bleeding vessels.

There are remedies, also, which are strictly termed astringent, and which seem, in consequence of their peculiar action on the vessels to which they are immediately applied, to occasion a state of contraction in distant vessels, independent of any perceptible stimulus. In this way, the vitriolic acid, in form of the tincture of roses of the London Pharmacopœia, and the gum kino with alum, are undoubtedly valuable

luable remedies in many cases, either of active or passive hæmorrhages. Peruvian Bark, too, is generally considered an astringent, and certainly possesses some of the characters of astringency; but, as I have formerly remarked, its operation appears evidently to be of a different kind, not being capable, in the manner of the remedies just mentioned, of suddenly inducing a state of contraction in the vessels. From the tonic power of Bark, however, or its property of gradually restoring strength, it may ultimately prove astringent; but this is to be considered rather as an indirect, than an immediate and direct astringent operation.

It must necessarily follow, from what has been said, that Peruvian Bark is more especially applicable to the interval of those hæmorrhages of the active kind, which occur in weakly, and at the same time irritable habits; while in passive hæmorrhage it is strongly indicated at any period of the affection, particularly in those instances of *menorrhagia*, or uterine hæmorrhage,

hæmorrhage, which are reducible to this head. In these there is scarcely any interval, the discharge of blood not being so great, in general, as to threaten immediate danger; but continuing, without fever, weeks or months together, in such a proportion as gradually to exhaust and destroy the miserable sufferer.

Under such circumstances, besides the exhibition of astringents, our best endeavours should be exerted to support the strength of the body by a light nourishing diet, by the free use of the Bark, and sometimes of chalybeates. When the stomach does not retain the Bark in powder, we have good encouragement to prescribe it in form of decoction, with orange-peel and elixir of vitriol, and in boluses, at the same time, composed of fifteen grains of extract of Bark, with an equal quantity of gum kino, half a drop of the oil of cinnamon, and a little of the conserve of roses. One of these, taken three or four times a day, and washed down with a cup full, either of the decoction,

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of

of an infusion of orange-peel, or of Port wine negus, forms a very elegant and agreeable method of administering it, and one, the efficacy of which I have several times experienced.

If the hæmorrhage depend on cancer, or ulceration of the uterus, cases of which are not uncommon, then a slight alleviation is only to be expected; but when there is no suspicion of such local mischief, a complete cure, under proper management, may be frequently effected.

C H A P. VI.

Of the Use of Bark in Dropsy, and in various other Disorders, chiefly of the chronic Kind.

THE causes of dropsy are so various, that it is impossible any one remedy, or single plan of treatment, should be applicable to every case of the disease. It

is, at all times, a disorder of so obstinate a nature, that, in general, it baffles the skill of the most experienced and able of the profession. Nor is this to be wondered at, as it is, for the most part, induced by long habits of intemperance, and by other causes producing a state of hardness and obstruction in the viscera; for the removal of which, there are scarcely any remedies that can be depended on.

But as dropsy sometimes originates from a state of simple debility, and from causes not having any immediate tendency to produce local affections, we should endeavour, to the utmost, to promote a recovery, by supporting the strength of the patient by means of Peruvian Bark and other tonics. If the effusion, however, be considerable, these cannot be expected to operate advantageously, until the lymphatic vessels be stimulated to absorption, and the water evacuated by emetics, cathartics, diuretics, or, occasionally, by diaphoretics.

When by all, or any of the above eva-

cuants, or by other means, the swellings are somewhat diminished, there can be no doubt of the propriety of administering tonics with considerable freedom; such as Bark and wine, with aromatics and chalybeates, assisted by a nourishing diet, friction, warm cloathing, and exercise; from a due perseverance in which the most salutary effects have been sometimes experienced. Without such a plan of treatment, a return of the disease is soon to be looked for, notwithstanding the most complete evacuation of the water should have been effected by cathartics, by mercury and squills, crem. tart., or by any other evacuant remedies.

Anasarca is a very common disease among the negroes in the West Indies, not only from the nature of their food, but from incautious exposure to the cold and moisture of the night when intoxicated. I have frequently known this form of dropsy terminate favourably, when attended to in time, by means of Bark joined with diuretic salt and aromatic species;

cies; a brisk emetic of vitr. alb.*, tart. emet., and even in some cases a grain or two of vitr. cærul.; or a cathartic of jalap, crem. tart., and calomel; or both emetic and cathartic, having preceded its tonic operation.

In those dropsies which arise from excessive loss of blood, as from uterine hæmorrhage, or in such as proceed from the debility consequent on fevers, the Bark can seldom be employed too soon, unless the distention be exceedingly great; for purg-

* Emetics may with justice, I think, be considered among the most valuable of the evacuant remedies in dropsy, as they occasion less debility than cathartics, and are more certain in promoting absorption than most of the diuretics. Many persons are averse to the action of vomiting, when symptoms of impeded respiration accompany this disease, from an idea that this is liable to be increased by it; but the contrary is the truth, for I have repeatedly known patients in such situations experience the greatest relief from the exhibition of an emetic. I have lately been informed indeed, that a case of general dropsey, which was almost considered desperate, as it had resisted a great variety of evacuant remedies, at length yielded in the most surprising manner to emetics of white vitriol.

ing and vomiting, but particularly the former, have been found very prejudicial under such circumstances.

Peruvian Bark has often been successfully employed for strengthening the tone of the stomach, and of the whole system, in cases of indigestion, or that complaint called *dyspepsia*, in the interval of atonic gout, chlorosis, fluor albus, gleet, and, in short, in all chronic complaints, where the stomach and intestines are either primarily or secondarily affected with loss of tone, as in worm cases in children, scurvy, tympanites, chronic apthæ, and in a variety of other affections to be mentioned hereafter.

In most of the above cases, the Bark should be given alternately with columbo-root, with the tinct. mart. in sp. sal., or with some other suitable chalybeate; in order to avoid the effects of habit, which have already been mentioned on the subject of intermittent fever. A light infusion of Bark is, for the most part, preferable likewise to any other preparation of it in the diseases

diseases just enumerated; but when acidity in the stomach becomes a troublesome symptom, the infusion with lime-water, which has been fully described, undoubtedly deserves the preference. In some cases too, Bark and Magnesia may be advantageously combined in the manner formerly recommended. No material benefit, however, is to be expected from all or any of these remedies, unless assisted by good air, exercise, a proper regulation of diet and amusements, tranquillity of mind, warm cloathing, and the occasional use of the flesh-brush.

In CHLOROSIS, the various preparations of iron are, perhaps, still more effectual than Peruvian Bark, though advantages are often gained in this, as well as in other diseases, by administering them in a state of combination, which could not have been obtained from either of them separately. And it is not to that condition of the body alone in which the *menfes* are deficient, strictly called chlorosis, that Bark and chalybeates are applicable; for there are many

examples of a suppression of the menstrual discharge, such as are denominated *amenorrhœa*, where the paleness and general loss of health attendant on chlorosis are not very observable, and where, notwithstanding, these remedies, assisted by exercise, have produced the happiest effects, after electricity, mercury, aloes, hellebore, and other emmenagogues had been employed to no purpose.

Persons of delicate and irritable constitutions, who are often troubled with diarrhœa, cholic, and cholera, or who have frequent returns of catarrh, should be strengthened in the interval of those diseases by Bark, and by the other means which have been taken notice of in different parts of this Treatise, as necessary to co-operate with it.

Few practitioners, I imagine, will doubt the propriety of employing Bark in the interval, and under the circumstances of the disorders just mentioned; but some physicians have recommended it even during the presence of the affections themselves, particularly

particularly in catarrh, concerning which, the following elegant passage is to be found in Sir George Baker's Treatise*. "Alia
 "longè atque dissimili curatione opus
 "fuit, ubi morbus jam in lentam febriculam degeneraverat, continuam eam
 "ferè cum accessionibus. Jam nimiae debilitati jacentis, et languenti stomacho
 "succurrendum fuit, adjicienda vis arteriis; toti corpori fultura. His in casibus, *Cortex Peruvianus*, subindè et liberaliter datus, raro spem nostram fefellit. Protinus utiquè arteriarum exigui imbecillique pulsus, tussicula, præcordiorum anxietas, suspiria, tremores, vertigines, animique deliquia nobili antidoto concesserunt. Oportebat autem iisdem ipsis auxiliis tueri valetudinem, quibus est reddita."

Dr. Whytt observes likewise, that he once swallowed near four ounces of this remedy in substance in sixteen days, when he laboured under a catarrhus cough,

* Vide Baker, de Catarrho et Dysenteria epidem. p. 13.

without feeling any bad effects from it; and that he had repeatedly experienced its virtues in curing a hoarseness after the measles, unattended with fever or difficulty of breathing*. Dr. Murray also mentions the good effects of it in his own person, under circumstances somewhat similar: “ Ipse debeo Cortici firmatos in
 “ me pulmones, quos catarrhus pertinax
 “ eoque pedissequa tussis nimium debi-
 “ litaverat†.”

It is not uncommon to meet with persons who have laboured under catarrh with copious expectoration for many years, and without any material inconvenience; nay, in old people, often with evident relief to the organs of respiration. But as the expectoration in such chronic catarrhs is sometimes so great as to be inconvenient, and to exhaust the strength considerably, it becomes necessary to employ Peruvian Bark, with a view to strengthen the whole body, and to diminish the discharge,

* See Whytt's Work, p. 636.

† Vide Apparatus Medicam. tom. i. p. 589.

by increasing the tone of the vessels distributed to the mucous membrane of the trachea.

The disease, which has been termed *phthisis pituitosa* by some physicians, appears to be nothing more than a species of catarrh of this kind, in which Bark may be expected likewise to prove serviceable. Huxham experienced good effects, in a disorder of this nature, from a decoction of Bark with guaiacum and styrax.

In DIABETES, the Bark has been recommended by different physicians; but how far this, or any other remedy that we are at present acquainted with, is capable of performing a cure, may be doubted. The debility and loss of flesh which accompany it, seem evidently to require the use of Peruvian Bark and chalybeates, and we have good encouragement to give them a full trial, as its duration and obstinacy afford a fair opportunity for observing the effects of a variety of medicines. The red Peruvian Bark of a good quality, in particular, joined with alum, gum kino, &c. should

should be administered freely, in order to ascertain whether tonics and astringents have any power that can be depended on over this formidable disease.

All the theories of diabetes, which have been adopted at different times, appear unsatisfactory. The authors of them have in a great measure overlooked two circumstances, that, in my opinion, merit considerable attention. The first is the extraordinary powers of the digestive organs; for food is not only received into the stomach in a proportion wonderfully greater than in health, but that food is easily and speedily subdued, so as not to occasion any weight or uneasiness of the organ. The result of the digestion too, is undoubtedly a very large supply of chyle; for in what other manner could such a quantity of *saccharine matter*, as has actually been obtained by evaporation, find its way into the urine?

The facility of digestion implies either an increase in the power or quality, or an increase of the ordinary quantity of the gastric

tric juice, as is satisfactorily proved by the experiments of Spallanzani*; hence an altered condition, or an increased secretion of this important fluid, is to be considered one of the leading phenomena of the disease.

An increased action of the lymphatic vessels constitutes the second circumstance worthy of observation in this disorder; an increased absorption, not only by the lacteals in the alimentary canal, but by the absorbent vessels on the surface of the body; for there can be no doubt that these last draw in a very great quantity of moisture from the atmosphere, a proportion vastly greater than that which is absorbed in health. In reasoning therefore, hereafter, on the nature and proximate cause of diabetes, the increased state of the functions of digestion and absorption, with the diminished power of sanguification (the abundant quantity of chyle, or even the

* See Experiments on Digestion, vol. i. of Dissertations relating to the natural history of animals and vegetables, translated from the Italian, p. 63 and 64.

ordinary

ordinary quantity probably not being changed into blood) should be kept constantly in view. I will not attempt to determine at present how far these *data*, to which I have been a witness in two instances of this disorder, are sufficient to lead to a satisfactory proximate cause; or to the suggestion of remedies which have not hitherto been recommended. They have been inserted in this place, from the belief that they are worthy of future examination, and because, if well founded, they may tend to explain why we should not form any great expectations of relief from Peruvian Bark; which produces the most favourable operation always in those examples of disease where the function of digestion is much impeded.

I shall conclude this chapter with some remarks on the use of Bark in JAUNDICE.

A variety of bitters and tonics have been employed on different occasions in this disease, and now and then Peruvian Bark among the rest. I cannot help thinking, that it is often strongly indicated, and
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should be still more frequently prescribed, being preferable to the common bitters; for loss of appetite, with acidity and flatulence in the stomach and alimentary canal, pointing out a loss of tone in these parts, are frequent symptoms of the disorder.

It has been found also, that emetics, frequently repeated, have been extremely serviceable in many cases of jaundice; but it is well known that such repetition constantly weakens the stomach; hence, to obviate this effect as much as possible, a cold infusion of Bark may be given between any two of the emetics. But there is another principle on which Bark may be supposed capable of doing service. Some persons, who are subject to frequent and sudden attacks of the disease, are of very irritable and delicate constitutions; sometimes connected with hysteria, and consequently with spasm of the biliary ducts. In such, the Bark administered in the interval, by strengthening the body, would have a great tendency, I conceive, to counteract the pre-disposition.

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I have lately seen two cases of jaundice, the one complicated with hypochondriasis, and very curious convulsive motions of the diaphragm and abdominal muscles; the other with scurvy and dropfy; in both of which the Bark was undoubtedly indicated.

C H A P. VII.

Of the Use of Bark in Epilepsy, Hysteria, and other Diseases, commonly called Nervous.

THIS remedy has been highly celebrated, at different times, for its power of subduing or alleviating many of these affections; but as they are exceedingly obstinate in their nature, often originating from fixed and hereditary causes, it has undoubtedly oftener failed than succeeded. On this account it has undeservedly fallen into neglect with many practitioners; for supposing its efficacy ascertained in one case in twenty, it is cer-
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tainly an object of importance, and worthy the attention of the prescriber.—Much has been said of late years, concerning the efficacy of different mineral tonics, as the preparations of zinc and copper, particularly in epilepsy; but there has been a source of error, which has not been sufficiently guarded against, in making observations on the subject. The paroxysms of this disease return at very uncertain intervals, so that, independent of any remedy whatever, a patient may not experience an attack for many months, although previously harrassed every week with the disorder; hence it becomes extremely difficult to determine on the powers of different medicines. In no case, scarcely can a cure be pronounced in less than a year or more from the time of the last paroxysm. A proper attention to this circumstance, will probably lead to the suspicion of many remedies, the virtues of which have been highly extolled; and although some degree of efficacy should even be annexed to their operation, we shall, after all, per-

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haps be ready to acknowledge, that Peruvian Bark, if genuine and properly administered, is in general to be considered in a superior point of view, being capable of proving serviceable in most of the cases to which the mineral tonics are adapted; so as either to deserve the preference, or at least to be given in combination with them.

It is clearly in the interval of the paroxysms only of epilepsy and hysteria, that Bark is indicated; when, by strengthening the tone of the stomach and intestines, and correcting the irritability of the whole body, a return of the disease, in proper time, is either prevented intirely, or the paroxysms rendered less frequent.

The prevention of the paroxysms in the first place, or an attempt to shorten their duration in the second, are objects of great consequence, as the recurrence of the disease seems frequently to be connected with habit; hence the use of æther, musk, asa-fœtida, camphor, opium, and other anti-spasmodics; but if the body be weak and
irritable,

irritable, these cannot be expected of themselves to effect a cure. Bark is then the remedy which is principally to be relied on, sometimes joined with chalybeates; on other occasions with elixir of vitriol; sometimes with bitters and aromatics, as recommended by Dr. Whytt*; and in many instances the most essential benefit has been obtained from the employment of the cold bath at the same time. It must be obvious likewise, that a careful regulation of diet and exercise here, as at other times, is necessary to insure the efficacy of the Bark. In some cases, valerian may be given along with it, in the manner advised by Dr. Mead and others in epilepsy; though there is some foundation for believing, that the encomiums bestowed upon this root have not been the result of frequent and well-directed observations, as it has failed repeatedly in the hands of many of the greatest eminence and candour in the profession.

* See Whytt's Works, p. 634, &c.

That we may not employ Bark indiscriminately in epilepsy and hysteria, and from thence experience frequent disappointments, it is necessary to keep in view the variety of causes on which they may depend. What can be expected from this, or indeed from any other remedy, when tumours and other organic affections within the cranium give origin to epilepsy; or when schirrous obstructions of the uterus and ovaria operate as the exciting cause of hysteria?—But, independent of any fixed local disorder, both of the diseases under consideration occasionally depend on a state of plethora, or an accumulation of blood, from want of exercise, indulgence in animal food, and various other sources: the antiphlogistic, rather than the tonic and stimulating plan of cure, is required at such times. I have seen cases of this kind, but am nevertheless inclined to believe, that they bear by no means so great a proportion to the whole, as some physicians of great authority have endeavoured to inculcate. Hysteria, in particular, can be distinctly

tinctly perceived, in many instances, to have originated from profuse evacuations, and from a state of great delicacy and irritability of constitution, independent of any degree of plethora. These are the cases, in which the greatest advantages are to be derived from the exhibition of Peruvian Bark, and in which it should seldom be withheld.

The SPASMODIC ASTHMA is a disease still more obstinate than those just treated of, but to which the observations already made, with regard to the use of antispasmodics, and to the exhibition of Bark, as being adapted either to the paroxysms, or to the interval of those diseases, are likewise applicable. It is more necessary, however, in asthma, to prescribe the different decoctions, infusions, and tinctures of the Bark; for if administered in substance, it is liable to occasion weight and oppression at the stomach, and to increase the difficulty of breathing.

IN CHOREA, or ST. VITUS'S DANCE, the utility of Peruvian Bark and the cold bath

278 DISEASES *wherein* BARK

has been long established; though the disease seems, in many instances, to have yielded to other tonics.—The practice of blood-letting, so strongly recommended by Sydenham in this disease, is seldom found admissible at this day; but cathartics in some cases of it, in order to evacuate the offensive contents of the *primæ viæ*, or to expel worms, previous to the exhibition of tonic remedies, are sometimes absolutely necessary, and a method of treatment which I have several times known succeed when others had failed.—Dr. Saunders generally recommends small doses of the vitr. alb., from one grain to three, twice or three times a day, and has been very successful, on different occasions, in effecting a cure with it at Guy's Hospital. Supposing the operation of this remedy, in such doses, to be of the tonic kind, or in any respect similar to Bark, a preference may probably arise with children in its favour, from the difficulty of prevailing on them to swallow the Bark in sufficient quantity.

Peruvian Bark has been advised, by many

practitioners, in that very troublesome and obstinate disease called HOOPING COUGH. According to Dr. Whytt, it is one of the best remedies, when given early, and before any obstructions are formed in the lungs*.

—Dr. Morris † experienced good effects from it, when joined with castor; and Dr. Lettsom speaks favourably of the combination of cantharides and Bark, originally recommended by Dr. Burton. The plan, however, advised by Dr. Fothergill, that of giving frequent antimonial emetics, appears to be most generally adopted, and to promise the greatest advantages; but that there are periods of the disease in which Bark is indicated, and in which it has occasionally assisted in performing a cure, is admitted even by Dr. Fothergill, and has never, indeed, as far as I know, been doubted.

Notwithstanding the plausible theory of HYPOCHONDRIASIS, which refers it

* Whytt's Works, p. 636.

† Medical Observations and Inquiries, vol. iii. p. 281, &c.

to a state of rigidity in the fibres, and which inculcates the use of the warm bath*; it cannot be denied that the cold bath and Peruvian Bark, or the removal from a warm climate to a cold one, have all been highly instrumental in promoting a recovery, or in alleviating the disease, on different occasions. — A proper attention to the state of the mind, so fully inculcated by Dr. Cullen, is certainly the chief object; but the flatulence and spasmodic affections of the stomach and alimentary canal are such as should lead, at the same time, to the employment of Peruvian Bark and other tonics. These are considered neither necessary nor safe by Dr. Cullen†, but have been recommended in the highest terms by other physicians of eminence; hence a trial of them becomes justifiable, in order that every man may be able, at

* See Cullen's Practice of Physic, 4th edition, iii. p. 264.

† See First Linns, 4th edition, vol. iii. p. 263.

length, to decide from his own experience on the subject.

Hypochondriasis is sometimes plainly connected with excess in venery and other debilitating causes ; which, I should imagine, cannot be more effectually opposed, in the way of medicine, than by Peruvian Bark and chalybeates. — Dr. Sydenham's authority is not a little in favour of the use of Bark in this disease, as may be seen from the following passage : — “ Ad hæc Peruvianus Cortex eximias mirandasque vires in sanguine, et spiritibus confortandis invigorandisque, habere nonnunquamprehenditur, cujus scrupulum unum, manè et serò, ad septimanas aliquot deglutitum, sanam firmamque corporis crasin (tam viris hypochondriacis, quam hystericis fœminis, diu multumque ægrotantibus, dejectâque jam quasi corporis œconomiâ) restituisse, ipse observavi *.”

* Sydenhami Opera, Lugd. Batav. p. 412.

TREMOR of different parts of the body is not an uncommon affection of the nervous kind. It is sometimes connected with convulsions ; at other times, with palsy ; and, on every occasion, seems to have more or less of debility for its foundation ; so that the free use of Bark, among other remedies, promises considerable advantages. Patients are not unfrequently affected with tremor for a long time after bad fevers ; and in warm climates especially, it is often an attendant upon the extraordinary accumulation of bile which some constitutions are liable to ; pointing out a state of great irritation in the nervous system, partly from intemperance, or, now and then, from the unfriendly operation of heat alone upon the human body. Under all these circumstances, Peruvian Bark is strongly indicated, and frequently affords the most essential relief to persons who have it not in their power immediately to adopt the salutary measure of removing to a cold or temperate climate.

I am rather surprised that Bark is not
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more commonly employed in those cases of Palsy which arise from the application of cold, in persons of a thin and delicate habit of body, and which are unconnected with any disorder in the *sensorium commune*. In hemiplegia, also, when there is no reason to suspect either general or partial plethora, but rather a state of diminished energy in the brain (several cases of which I have seen), it is probable that some advantages might be derived from its exhibition. Electricity, mustard-seed, vol. alk., and other remedies of that nature, usually recommended in such cases, may still be had recourse to, though it is certain that their operation is often temporary only, and seldom adequate to a complete cure.

A remarkable case of suppression of urine cured by the Bark, and apparently connected with paralysis of the bladder, is related in the London Medical Observations and Inquiries*, and affords good

* Vol. i. p. 81.

grounds for a trial of the same remedy in similar situations. In paralysis of the bladder, too, attended with an opposite state, viz. an involuntary discharge of urine, Bark may be tried along with the other remedies generally employed; and, if a considerable discharge of mucus be present at the same time, constituting what is called *cyfisterrhæa*, various tonic and astringent medicines should be combined with it.

The habitual costiveness mentioned, in Dr. Cullen's Lectures on the Materia Medica*, as having been cured by Peruvian Bark, may with propriety, perhaps, be referred to a condition of the muscular fibres of the intestines, approaching to paralysis.

When PALPITATION and SYNCOPÉ are symptoms only of hysteria, the plan laid down in treating of that disease must be adopted; and in other cases, where there

* Quarto edition, p. 288.

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is no suspicion of organic affections, the Bark given in the interval may be expected to prove serviceable, especially if a delicate and disordered state of the stomach, which is not uncommon, gives rise to them.

SECTION

SECTION II.

CHAPTER I.

*Of the Use of Bark in promoting Suppuration,
and in the Cure of Gangrene.*

THE present chapter, it must be obvious, relates more particularly to Surgery; in which the Bark admits of a very extensive application, and, when properly and judiciously administered, is often productive of the most essential advantages. Its power of promoting a favourable suppuration, in a variety of instances, is uppermost in the mind of every physician and surgeon. But, that we may the more readily understand in what situations it is especially indicated, it may be proper to bestow some attention on the nature of pus; on the effects which have been attributed

buted to it; and on the causes that tend to oppose its formation. This is a subject not only of curiosity, but of the utmost importance, and should be thoroughly understood by every surgeon who wishes for success and reputation.

In by far the greater number of diseases, which require the aid of surgery, pus is formed, either previous to, or consequent upon, operations; for, although considerable improvements have been made in modern surgery, by avoiding suppuration, or, in other words, by producing union by the first intention, through the medium of coagulable lymph*; yet there are many operations which do not admit of such an attempt. The healing of the parts in these instances is, on the contrary, effect-

* This practice is particularly applicable in the removal of different tumours, where the skin can be preserved, and the parts brought together by sticking-plaster, without any degree of suppuration. It has lately been very fully illustrated, and judiciously inculcated, by my friend Mr. Fearon, surgeon to the Surry dispensary, in his Treatise on Cancers.

ed by what is termed, a process of granulation and suppuration, or the second and more tedious method of union.

The process of suppuration just mentioned is the inevitable attendant on most gun-shot wounds, on many compound fractures, on exfoliation, and on the separation of dead and mortified parts from the living. Of the last I shall treat separately; though in all these, as well as in many abscesses and ulcers, and after a variety of operations likewise, the use of Bark often becomes indispensably necessary, with the view of inducing a favourable state of suppuration.

By pus is generally meant, that mild, yellowish, opaque, thickish, and almost inodorous fluid, which is found on the surface of ulcerated parts, accompanied by florid and healthy granulations; or which is contained in abscesses; but the properties of which no chemical investigation has hitherto ascertained in a degree sufficient to lead to practical utility. Those accustomed, however, to observe the variety

riety of appearances which it is capable of assuming, know tolerably well when to consider it of a healthy and perfect kind; when it is more or less diseased; and when, at length, the discharge from ulcers is of so different a quality, as not in any degree to deserve the title of purulence, but rather to acquire the denomination of a sanious and offensive ichor.

There are several questions relating to the formation of pus, which admit of a great diversity of opinion, and on which it would be improper that we should bestow a full consideration. Thus a process of stagnation and fermentation is supposed by some to be essential to its formation; whilst others attribute it, with a greater degree of probability, to a process of secretion. Some consider ulceration absolutely necessary to its presence; whilst others contend, that it may be deposited from the extremities of inflamed arteries, independent of any solution of continuity or loss of substance. If this be true, the advantages which have been proposed, of distinguishing pus from mucus, in forming a prognosis in phthisis

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pulmonalis, must fall to the ground, and the chemical nature of the two, if even accurately determined, would lead, in this point of view, to no utility whatever; for it is said, and I believe with much truth, that pus may be coughed up occasionally, without ulceration in the lungs, or any considerable danger: and, on the other hand, it is now pretty generally understood, that one of the most dangerous forms of consumption, to be treated of under the head of Scrophula, may prove fatal with a very slight degree either of ulceration or suppuration.

Another question relating to pus is, whether the absorption of it into the mass of circulating fluids be sufficient for the production of hectic fever. That this fatal symptomatic affection * is the effect of such

* We call Hectic Fever a symptomatic disorder; and this is the view taken of it by most persons; though I shall not attempt to deny, that it may, now and then, be an idiopathic disease. When connected with much debility, as happens, in some few instances,

such a cause, seems to be more and more doubted every day; for there are innumerable instances of considerable collections of pus without it; and on many occasions, when there has not been the slightest suspicion of its collection, hectic fever has notwithstanding been present. Farther: it is seldom that the disease bears any proportion to the quantity of pus; for in cases of tubercular consumption, with scarcely any ulceration, the symptoms are strongly marked, and appear early; whereas, in a disease of the knee joint, it often does not make its appearance for a long time after the pus has collected to a great extent. Observations of this kind have led Mr. John Hunter to the plausible and ingenious opinion, that hectic fever is rather to be considered as a state of the body,

to nurses who have long given suck, the Bark may be expected to prove serviceable. Dr. Heberden, however, observes, in the 2d vol. of the Med. Transactions, that he never saw it useful in this fever, unattended with an apparent ulcer.

pointing out some great difficulty in the functions, in consequence of an obstinate and tedious disorder; often of an incurable organic affection; and that it is occasioned more readily, in proportion as the part concerned is more essential to life. But, however true this may be, it is certain that hectic is often connected with suppuration, whether from some accompanying state of disease or not; and, under such circumstances, the Bark is often effectual both in mending the discharge and in curing the fever.

In one point of view, the formation of pus may be esteemed a salutary operation; as when, for instance, it is an attendant upon the healing of parts which have been exposed, and in which union by the first intention could not be effected. When subsequent upon inflammation, either of superficial, or deep-seated parts, it is to be considered more in the light of disease, however preferable to the termination by gangrene, and when effused into large cavities, as between the folds of the pleura,

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in the pericardium, or in the cavity of the abdomen, it constitutes one of the most alarming affections, and often terminates fatally. But, if circumscribed, as sometimes happens, in persons of sound constitutions, then the pus is gradually accumulated; the neighbouring parts, and particularly those which are most external, are absorbed; the fluid obtains an exit, and the part heals kindly, with little or no assistance from art: this is the case occasionally, even with abscesses in the lungs and liver.

As a certain degree of vigour, or vital energy, is in general necessary to the production of perfect pus, so the same condition is, I believe, still more essential to the formation of a complete circumscribed abscess, which implies a power in the vessels of depositing a sufficient quantity of coagulable lymph around the inflamed part, so that the pus should not be diffused to any extent. Were it not for a provision of this kind, pus, effused into any one part of the cellular membrane,

would make its way throughout the whole of it, which is well known not to be the case, except in very diseased constitutions, and where there is a great failure of the *vis vitæ*; then, indeed, the fluid which is poured out passes on to a considerable extent, unless the body be soon invigorated by means of Bark and other tonics.

It is not in every case that Peruvian Bark is capable of promoting a favourable suppuration; for, although the discharge from ulcers and abscesses is often of a bad quality, from a state of debility of the whole system; yet an opposite state of the body or part, that of too great inflammation and action, would seem to be equally unfavourable to its production. We are not accustomed to speak of bleeding, and other evacuations, for the purpose of bringing about a kindly suppuration; but it is certain that they may sometimes be employed to this effect, with as much propriety as Bark is given in other cases. It is on this principle that rest and the horizontal posture of the limb, that emollient

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and sedative applications, purging, and a milk and vegetable diet, have occasionally proved effectual in the cure of ulcers, which might have been highly exasperated by Bark and other means so much approved of under different circumstances. Farther : a state of too great irritability of the constitution, or of a part, may be the cause of an unfavourable discharge from ulcers and abscesses ; at which time, opium and cicuta are probably still more effectual than Bark in promoting suppuration. There is the best reason, in fact, to apprehend that the states of the whole body, or particular parts, which oppose the formation of healthy and perfect pus, are exceedingly numerous ; and in order, therefore, to determine *a priori* when the Bark is indicated and likely to prove serviceable, these should be kept in view and carefully investigated.

Many of these conditions, it is to be regretted, are extremely difficult to be understood or explained ; for, although it is common to refer them to scrophula, can-

cer, scurvy, and lues venerea, I am much disposed to believe, that ulcerations frequently remain obstinate, when all these are entirely out of the question; and, what may appear more extraordinary, when neither a state of too great, or its opposite, too diminished action, or even the irritable condition, which has been mentioned, in the whole body, or in the part, are alone sufficient to explain the want of success in the treatment.

It must be confessed, at the same time, that as these are the circumstances which chiefly operate in retarding the formation of good pus, they must in a great measure regulate our practice, until other sources shall be discovered, and the means best adapted to them pointed out. I shall be under the necessity of taking notice of scrophulous and venereal ulcers in the next chapters, in treating of those subjects at large; but, in the mean time, we may be sufficiently sensible, that the remedies calculated to favour the production of pus, on different occasions, are exceedingly nume-

rous. Bark is undoubtedly a very principal one, and admits, perhaps, of the most extensive application; but we cannot be at a loss to understand, why opium is often necessary to co-operate with it; and why, on different occasions, evacuations, mercurials, good air and a milk diet, sarsaparilla, cicuta, and a variety of general or local stimulants, and sedatives, may be preferable to it.

Ranby's treatise on gun-shot wounds was written almost intirely with the view of inculcating the free use of the Bark; and the authorities in favour of it, in these as well as in numberless other instances in surgery, are so numerous, that it would not only be an endless, but an unprofitable labour to bring them forward in an essay of this kind. It is the less necessary, because scarcely any person doubts its wonderful efficacy; so that it is not from ignorance, but from negligence, or from not bestowing sufficient attention in discriminating the various conditions which have been taken notice of, that Bark, in any particular

ticular case, is either not administered at all, or without the desired effect.

A state of general debility is an almost unerring guide with regard to the exhibition of Bark in ulcers, though it has been asserted, that the ulceration of the lungs in phthisis pulmonalis is an exception to this rule. It is of the utmost importance to determine this point, and I shall accordingly bestow particular attention on it, in speaking of the different forms of scrophula, to which it is conveniently referred.

When pus is perfect, and in moderate quantity, little is in general required from art; but we often meet with cases, in which the constitution is much debilitated, attended with hectic fever and colliquative sweats, and where, notwithstanding, the pus is white and apparently good. On an attentive examination, however, we perceive in such instances that it is faulty, both in consistence and quantity, being thin, and bearing by far too great a proportion to the surface from which it is discharged; and, for
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any thing that is known to the contrary, it may be vitiated at such times in other respects, not discernible to the eye.—But, supposing the suppuration of the most favourable kind, if the surface exposed be great, and the constitution of the patient rather weakly and delicate, it may be advisable to employ Bark in moderate quantity, with a view of restoring the loss of strength attendant even on a necessary secretion. Should we wait until the pus actually becomes bad from considerable debility, then a much greater quantity of Bark is necessary than might otherwise have been sufficient for securing a favourable termination. Such an early exhibition of this remedy would probably have a tendency to prevent the locked jaw, and other forms of that fatal spasmodic affection termed Tetanus, which every now and then make their appearance after amputations, and other operations, and in some instances, when no fault in the condition of the pus or ulcer can be distinctly ascertained.

In suppurations of the joints, bones,
&c.

&c. before amputation is determined on, the Bark should undergo a full trial, and if it does not agree in substance, the decoction and tincture should be given freely. Sometimes a moderate quantity of wine, and a proper regulation of diet, will secure its efficacy; on other occasions cicuta should be given, with and without the Bark; in cases of colliquative sweats, elixir of vitriol should rather be joined with it; and in most instances, very admirable effects may be obtained by procuring regular rest at night, by means of opium joined with some grateful aromatic.

The great advantages, which have been so frequently experienced from Bark in GANGRENE, depend, as far as I can perceive, exactly on the principles which have been laid down with regard to its power of promoting suppuration; for the separation of a mortified or dead, from the surrounding living parts, seems evidently to be effected by a process of absorption and ulceration, accompanied by the secretion of pus; so that when the sloughing,

as it is called, is finished, the part thus freed from its incumbrance is left, in every respect, in the condition of a simple ulcer.

There is a striking analogy between this process, and that which takes place in the exfoliation of bone, so fully explained by Mr. John Hunter; and hence it is, that in both instances Bark, by increasing the tone of the vessels, induces, if deficient, the state of action necessary for bringing about a salutary termination; but with this difference, that the exfoliation of bone is effected far more slowly, from the different structure of the parts.

To shew how perfectly the principles regulating successful practice in gangrene, correspond with those which are applicable to the promoting a favourable suppuration in other cases, we need only remark, that it is not invariably to every case of gangrene that Bark is adapted; for the action of the vessels surrounding the mortified part may be so violent, as to terminate in gangrene themselves, if not checked by evacuations.

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This leads to a division of this affection, and into an inquiry concerning the causes from which it proceeds. It is commonly divided into two species; that which arises from a state of debility of the vessels, independent of any previous excitement or increased action; and, 2dly, that which is induced, in a body previously healthy, by some violent injury inflicted on a part, or inflammation otherwise excited; the increased action of the vessels terminating in the death of the part. To these I would add a third species, which may be termed the gangrene of debility with irritability. It is exceedingly frequent, and arises from a state of action or inflammation produced in vessels previously in a state of debility; and at such times, the slightest increased action ends in the death of the part; as often happens from blisters or scarifications in dropical patients. This species differs from the last very essentially; for the debility of the whole system is evident, and Bark is strongly indicated, though its operation may be favoured or highly promoted by means of opium;

um; whereas evacuations are most likely to do service in the other, when it is accompanied by inflammatory fever, or general increased action; and where the parts surrounding the gangrene are still in a condition of active and violent inflammation.

The state of the pulse, with other appearances of a diminished *vis vitæ*, should direct us more in such cases, I believe, in the use of Bark, than any appearance of the part itself; and whenever this general debility becomes evident, whether the gangrene has been preceded by inflammation or not, then the Bark, administered freely, is undoubtedly the chief remedy to be relied on. I am certain, however, that I have more than once seen it given too early; at a time when the farther progress of the gangrene would have been more effectually checked by moderate evacuations.

I will not attempt to decide whether the gangrene described by Mr. Pott, and successfully treated by him with large doses of opium, is to be considered as a species distinct

distinct from either of those which have been mentioned; or if it be only a variety of the irritable species; but it is not improbable that Bark may be occasionally required in this as well as the others.

CHAP. II.

Of the Use of Bark in scrophulous Affections, including Rickets, particular Forms of Phthisis Pulmonalis, Hydrocephalus, &c.

IT is much to be regretted, that we are as yet scarcely in possession of any remedy, or even perhaps of any plan of treatment, capable of curing, or totally eradicating, this frequent and melancholy disorder. There are undoubtedly, however, particular symptoms or forms of it, which can either be prevented, alleviated, or removed for a time, by the assistance of medicines; and an object of this importance being once accomplished, we have the satisfaction

faction occasionally of observing such changes in the body, during the progress of growth, as enable it to resist the exciting causes of the disease, so that it never again shews itself.

Among the remedies which are best calculated for restraining the progress of scrophula, Peruvian Bark deserves, in my opinion, to be particularly enumerated. Since the recommendation given of it by Dr. John Fordyce, and by Dr. Fothergill, in the first volume of the London Medical Observations, it has been pretty generally employed; and, notwithstanding it has often failed, and is held in slight estimation by some very eminent men in the profession, yet there are many others, who are strongly convinced of the advantages to be derived from it, and who almost constantly have recourse to it in this disease.

It is very unreasonable to expect that a remedy should prove useful in every case of a disorder, in the general treatment of which it has been recommended; and not only uncandid, but highly injudicious, to

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reject it intirely, until, from repeated trials, it has been found either hurtful or inefficacious, or until the source of error, in the person who has given a favourable account of it, is detected and pointed out. This observation is applicable to many other remedies, which are either extravagantly extolled on the one hand, or intirely neglected or abused on the other, according to the humour of different individuals. If we bestow sufficient attention on the difference of constitution, the various periods or forms of the same disease, the complication with other disorders, and, above all, the different state of remedies on different occasions; we shall not be at a loss to explain the want of success which is frequently experienced in the exhibition of the most powerful and efficacious articles of the *Materia Medica*. Whenever, therefore, we are able to determine, that any particular remedy has been repeatedly given without inconvenience; and that sometimes, on the contrary, the desired effect has resulted from its use, it should
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be considered a very valuable acquisition; especially in chronic diseases, where there is time for the trial of a great variety of medicines.—It is exactly on this footing that we are to regard the exhibition of Peruvian Bark in scrophula. But, that the cases in which it is most likely to prove serviceable may be better understood, with the remedies which are proper to co-operate with it on different occasions, I shall attempt a division or arrangement of the various affections, which seem to derive their origin from, or to be materially connected with, this deplorable state of the constitution.

To give a satisfactory definition of scrophula, is almost impossible, as it appears under a wonderful variety of forms, occupying parts of the body different in their structure and functions, and frequently exhibiting symptoms almost of an opposite kind. It must be confessed, at the same time, that, in all the cases, there are certain circumstances of agreement, which lead physicians to the belief, that they

originate from a similar cause; the diversity depending on the operation of other causes, which cannot always easily be ascertained.

The division of scrophulous complaints, into those which are of an *indolent*, and those again which are of an *irritable* nature, appears to be strongly supported by the phenomena of the disease; and to be that which, if duly attended to, would, in my opinion, lead to a more successful method of treatment, than is generally adopted.

Among the indolent forms of scrophula must be ranked, almost invariably, the affection of the mesenteric glands, and the rickets*; while the swelling of the glands in

* It has been common to consider *rickets* a distinct disease, and to treat of it therefore, in general, as not having any necessary reference to scrophula. I have ventured, in this Essay, to adopt a different opinion, and shall mention the reasons which have induced me rather to consider them as varieties of the same disorder.

In the first place, scrophula is acknowledged by most

in the neck, and other parts of the body, and the diseases of the joints and bones, are

most persons, principally to affect the glands and bones; and the same, as far as I can determine, holds good with rickets; for in all the dissections of ricketty patients, that are mentioned by authors, and particularly by *Glisson*, the various glands of the abdomen, and not only the lymphatic glands of the mesentery, but those about the lungs, &c., have been found much diseased. During life too, the tumid abdomen is scarcely ever absent, which is, *cæteris paribus*, a striking mark of scrophulous affection.

2dly. Debility alone is insufficient for the production of rickets, as many children pass through all the stages and degrees of it, without such effects being ever observed. Some additional disposition of the body seems evidently necessary, and that appears to me to be the scrophulous, or a disposition exactly similar to that which favours scrophula.

3dly. Before the enlargement and incurvations of the bones take place in rickets, there are evident symptoms of a disordered condition of the *primæ viæ*, and of an impeded absorption of the chyle; and these can be explained, I conceive, in no way more satisfactory, than by supposing the previous existence of diseased mesenteric glands.

4thly. All agree, that rickets and scrophula are sometimes met with in the same patient, and Sauvages admits a species of rachitis strumosa. Now, as they

are sometimes of the indolent, though more frequently of an irritable nature.

Under the irritable species of this disease, I would arrange those affections of the glands, joints, and bones, which are at-

are thus often blended together, and, as not only the same exciting causes can be observed in their production, but the same remedies have been found by experience to be applicable to both, are not all these circumstances sufficient to persuade us that they are one and the same disease? It is very uncommon to meet with two different disorders occurring so frequently at the same time in the same patient. Such an occurrence is accidental, and much more inconstant; and contra-indications often arise; the contrary of which, I have already observed, is the truth in the present instance. Farther: Rickets and the various appearances of scrophula are not more unlike than any two of the cases which are usually considered scrophulous; as, for instance, the simple mesenteric disease, or affection of the glands in the neck, compared with a simple state of *spina ventosa*. These are more different in their appearances, or tend more to give the idea of distinct diseases, than when the comparison is made between rickets and either or both of them.

Lastly. The same age and climate seem to favour rickets as well as the other appearances of scrophula.— All these will, I hope, answer the purpose at least of rendering probable the opinion which I have advanced.

tended with inflammation, or which cannot be referred to the other division, together with scrophulous ophthalmia, phthisis pulmonalis, and a species of hydrocephalus which has not hitherto been described. It is common, indeed, to divide hydrocephalus into acute and chronic; and the latter has been frequently said to occur in scrophulous habits, attended with a state of laxity and debility of the whole system. We are indebted to the ingenious and accurate observations of Dr. Quin, of Dublin, for having pointed out, in his inaugural dissertation, published at Edinburgh, a few years ago, an acute species of the disease, arising from plethora in the vessels of the brain; for the cure of which he recommends evacuations and the antiphlogistic regimen. I am disposed to believe, however, that there is another species of acute hydrocephalus, which is truly scrophulous, and in which topical, not general, evacuations are indicated.

When at Edinburgh, I had an opportunity of dissecting a child, who died of

hydrocephalus, in whom some singular marks of disease were observed.—The countenance and habit of body were apparently scrophulous, and this idea was confirmed by the condition of the brain; for there was not only a collection of water in the ventricles, from six to eight ounces, but, situated underneath, were several encysted tumours, containing each about two ounces of pus, with more or less of that cheesy like substance which is often met with in scrophulous abscesses in other parts of the body.

The collection of pus certainly implies some degree of inflammation; but the accompanying circumstances prove it to be of that irritable kind, which has been mentioned, in several parts of this Essay, as arising from an unequal determination of blood in cases of general debility, and in which, therefore, topical evacuations only are admissible; our best endeavours being exerted at the same time to support the strength

strength of the system by means of Bark and other tonics.

In no diseased state of the body, is the principle formerly laid down, concerning inflammation of a part, with debility and delicacy of the constitution, more fully illustrated than in scrophula; hence the utility of Bark in the troublesome ophthalmias, in the inflammations and suppurations of the joints and bones, and in various obstinate ulcerations, which take their rise from it. If Bark be admissible too in phthisis pulmonalis, it must be for the same reason; but, as many persons have asserted, that it is not productive of beneficial effects in this disease, it is proper that the subject should be examined with some care in this place.

It is generally allowed, that phthisis depends for the most part on a scrophulous constitution; and no person, I presume, will deny, that the tubercles, ulceration, and even inflammation of the lungs, are often connected likewise with a state of debility of the system at large; especially when
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the complaint has made any degree of progress. Practitioners are now so sensible of this truth, that the antiphlogistic plan of treatment is seldom carried to that length, which was formerly the practice. The insufficiency of it in the advanced periods of the disease, became every day more apparent; so that physicians have been obliged to acknowledge, that the intention of taking away a small quantity of blood occasionally, is rather to procure a temporary relief, than with the expectation of effecting a cure. Many have even admitted, that it is rational, in the mean time, to support the vigour of the body by means of tonics and a more generous diet; hence the use of myrrh and chalybeates, which have been highly recommended by Dr. Griffiths and Dr. Saunders.

But at the same time that the debility attendant on phthisis pulmonalis has not intirely escaped the attention of medical men, they have contended, that the inflammation and ulceration being peculiarly situated, from the great quantity of blood
which

which circulates through the lungs, any increased impetus of circulation, produced by stimulants, must be severely felt, and a train of unfavourable symptoms immediately excited. Some have affirmed, that the exhibition of Peruvian Bark has been known to occasion the greatest difficulty in respiration under such circumstances, and that it is therefore to be considered in the light of an uncertain or hazardous remedy. Authorities, however, are not wanting in favour of the Bark, when prudently administered. Besides Morton, who extols it highly, we have the testimony of Sir John Pringle in its favour. He observes, that he had frequently given three or four spoonfuls of a decoction of Bark twice a day, without observing that it heated, or obstructed the breathing; but, on the contrary, that it had a good effect when the patient complained of low spirits and weakness*.

If the quantity of the remedy employed by this author be thought too inconsiderable to afford any conclusion in its favour,

* Army Diseases, third edition, p. 164; note.

it may be proper to refer to an account of several very alarming cases of pulmonary affections successfully treated by a more liberal exhibition of Bark, lately published in the Medical Communications*.

The authorities also formerly mentioned, under the head of Catarrh, a disease much connected with consumption, may be adduced in farther support of the utility of Bark in this disorder; and it may contribute to the same purpose, to insert in this place, from an author of reputation, who has lately written on the *Materia Medica*, the following passage. “*Binos*
 “*ipse ab empyemate Chinchina (i. e. Cort.*
 “*Peruv.) curavi. Quo magis sputa fœtent,*
 “*eo certior cura. In phthisi pulmonali*
 “*sæpè quidem præclara præstat, sæpè au-*
 “*tem nihil efficit. Quando apthæ ac-*
 “*cesserunt, symptomaticæ in hoc morbo,*
 “*non evidenter nocuit, nisi sputa sup-*
 “*pressisse diceres. Certè, ubi sputa in*
 “*phthisi nimis abundant, Cortex indi-*
 “*catur; si verò, cum oppressione pectoris,*

* See Medical Communications, vol. i. p. 260, &c.

“ subito

“subitò diminuantur, Cortici non inhæ-
rendum.—Nullam vidi noxam ex mode-
rata dosi Chinchinæ quotidie sumpta in
phthisi, etiamsi sanguis, per venam sectam
emissus, crustâ inflammatoriâ obductus
subinde fuit*.”

I am well aware, that there are certain cases to which the Bark is by no means adapted; but the same objection may be made either to myrrh and steel, a more generous diet, or any plan of treatment of this nature.—All that is necessary to be done, is to make a cautious trial of such tonic remedies; as for instance, of an infusion or decoction of Bark in the first place; and if no inconvenience arises to the patient, good encouragement is afforded for the exhibition of the powder, with or without the tincture of roses. I have seen it employed more than once, in this mode of combination, with advantage, and should on that account, in most cases, give it the preference.

We are certainly called upon, by the mi-

*Vide Bergius Materia Medica, tom. i. p. 109.
ferable

ferable sufferers who are afflicted with consumption, to give them this or some other similar chance of a recovery. If the ulceration, or what may be sometimes as bad, or worse, a considerable state of induration, or numerous tubercles without any suppuration, be found beyond the reach of medicine, the satisfaction of protracting the life of the patient a few months, by strengthening the body, may still perhaps remain. And I must confess, that on the whole, I should be disposed to form greater expectations from Bark, in preventing this formidable disease, in scrophulous and delicate habits disposed to it, than in subduing it after it has once established itself; though even here it deserves a full trial.

But to return to a general consideration of scrophula; it may be remarked, that there are few cases of it, in which Peruvian Bark is not in some degree indicated, at one or at another period of the complaint; for although I have divided the disease into indolent and irritable,

I consider

I consider it extremely well adapted to both of them. The utility therefore of the division which has been mentioned, arises chiefly from the investigation which it leads to, of the remedies that are proper to be joined with the Bark. These we shall find differ essentially in the two different forms of the disorder.

Without the assistance of Peruvian Bark, patients would soon sink under the excessive quantity of the discharge, in affections of the joints, bones, and many other ulcerations, occurring in scrophulous constitutions.—There are some who would probably be inclined to object to its use in the beginning of such complaints, before supuration had taken place, and where there seemed only to be a state of inflammation. But, from what has been already said, it must follow, that neither an inflammation of the knee, hip, or lungs, is a proof of general increased action, or phlogistic diathesis. I should, in general, on that account, especially if the pulse and habit of the patient were characteristic of debility,
prescribe

prescribe means calculated to keep up the vigour of the system ; at the same time, that by topical applications, as bleeding with leeches, cupping, blisters, caustics, or setons, I should endeavour to abate the inflammation of the part ; hence, in inflammation of the joints, the Bark may be given with safety ; the stimulus arising from it being such as not to endanger an increase of action in the vessels of a distant part of the body.—All simple and active stimuli, however, should be carefully avoided. Mercury and many other stimulants would obviously do harm ; though in other forms of the disease they may be employed with safety and advantage.

In the cases of scrophula which are referrible to the *irritable species*, the occasional use of opium, and more particularly of cicuta, are better calculated to co-operate with Bark than any remedies I am acquainted with. The preparation of Bark and lime-water also, mentioned in a former part of the Essay, has been found effectual in many cases of obstinate scrophulous

lous ophthalmia, which did not appear to yield to Bark administered alone.

The remedies best suited to co-operate with the Bark, in the *indolent* forms of scrophula, are mercury, various stimulant and saline substances, and electricity. That such an indolent state of the constitution as I have hinted at does really occur in some cases of scrophula, cannot be doubted by those who have attended to the tabes mesenterica, and to rickets, if it be allowed that this last is to be ranked among the affections under consideration. A considerable state of inactivity and torpor is, in fact, one of the characteristics of these complaints; and, with regard to the swellings of the glands in the neck and other parts of the body, and diseases of the joints, we certainly find them, in some instances, rather assuming the indolent than the irritable appearance, continuing many months scarcely with any signs of action, inflammation, or suppuration. Scrophulous ulcers, likewise, occasionally exhibit a similar disposition, making no remarkable progress

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gress either in healing or spreading for a great length of time. All these furnish sufficient examples of what may, I think, be termed with propriety the indolent form of scrophula; an attention to which may, perhaps, assist in reconciling the very opposite accounts which have been given of mercury by different practitioners. Some have recommended it very highly, while others condemn it as little short of a poison, probably from having indiscriminately employed it.

There can be no doubt that scrophulous patients have often been materially injured by too free an use of the remedy in question, or by an injudicious exposure to cold during its exhibition, particularly if pre-disposed to phthisis, or already affected with the disease; but in the indolent cases of scrophula I should expect, from what I have seen, that the action of Bark and other tonics would, in general, be greatly promoted by the moderate use of mercurial medicines.

Mr. White, who has lately published a
treatise

treatise on scrophula, speaks very highly of the efficacy of calomel in the tabes mesenterica; and I have met with several instances which were much in favour of this practice, where small doses of it were administered either previous to, or given alternately with, Bark and chalybeates. But, as mercury is a very active stimulant, it should be omitted, or exhibited only with the greatest caution, when scrophulous tumours become inflamed, or when tubercles in the lungs are in a state of action threatening suppuration. Hectic fever too, from whatever cause, is a condition of the body that does not seem to admit of the use of this remedy. Farther: if the *vis vitæ* be much diminished, the evacuant power of mercury, which it is often difficult to regulate, is much to be feared. And, lastly, it is undeniable, that there are some scrophulous ulcerations of such an irritable nature, that it constantly renders them more violent. This is frequently seen when they happen to be conjoined with lues, or when they are mis-

understood, and supposed to be of a venereal nature. A consideration of all these will enable us to determine when mercury is likely to prove hurtful, and under what circumstances it is admissible, and calculated to co-operate with the Bark.

In many scrophulous tumours and ulcers the sal sodæ, or fossil alkali, in doses of ten or fifteen grains, may be exhibited along with a decoction of Bark with considerable benefit; but it appears to me that it is rather to the indolent than irritable species of the disorder that this and some other saline remedies are applicable.

C H A P. III.

Of the Use of Bark in the Lues Venerea.

SOME persons may probably be disposed to condemn me for treating of the use of Peruvian Bark in so great a variety of diseases; and the present chapter, on a superficial examination, would lead more particularly to the opinion that I had
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is particularly required. 325

an inclination to intrude it on the world as an universal remedy; but it must be obvious to the candid reader that this has been very far from my intention. I have endeavoured, on the contrary, throughout the whole, to point out the cases in which, if trusted to alone, it will be found inadequate to the purposes of a cure, and have thus wished to establish its efficacy on a just and permanent foundation. From indiscriminate praise, this, and many other articles of the *Materia Medica*, have occasionally fallen into neglect, in the treatment of diseases to which they were highly applicable; hence, I have cautiously avoided attributing more to it than it really deserves.—I do not propose, on the present occasion, to recommend the Bark as a remedy by any means equal to the cure of a confirmed lues; but rather, by taking a short view of the inconveniences arising from the injudicious and indiscriminate use of mercury, to inculcate the necessity of having recourse frequently to different tonic remedies, and especially to the one

under consideration, in order to co-operate with the mercury, and secure the constitution from its pernicious operation.

There is no remedy more universally applicable to any one disease than mercury to the lues; but the difference in the constitutions of different individuals is so great, that the quantity and mode of exhibition adopted by one patient with impunity, would almost endanger the life of another; so that there are few articles in the *Materia Medica*, the management of which requires greater medical skill, in order to insure its efficacy, and at the same time to prevent any material injury to the constitution.

The action which is induced in the body by mercury is of that unfriendly kind, that, unless moderated, or in a certain degree obviated by other remedies, the most serious consequences are sometimes to be apprehended. Practitioners have been anxious, on this account, at different times, to find out some other remedy capable of destroying the venereal virus with greater safety.

safety. Many specifics have been recommended; but, till lately, it has generally been believed that mercury was still the only one to be depended on. At present, opium is supposed by some persons to possess this specific quality, though this is doubted by others; and, on the whole, it is not in my power to form any decided conclusion on the subject. It is proper, however, to mention, in justice to my friend Mr. Forster, one of the surgeons to the army, that he has informed me, that the trials which he made with opium among the soldiers in the military hospitals in America, during the war, were highly favourable to the opinion that it is capable of subduing the venereal poison. But, supposing it ascertained, that opium really possesses an antivenereal power, a question of some importance will naturally arise; viz. Whether it may not be possible to employ mercury in such a way as to occasion less inconvenience than would result from the quantity of opium which would be required, and from the danger

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that patients might acquire the pernicious habit of using it constantly afterwards, in consequence of having accidentally arrived at the knowledge of the remedy to which they had been indebted for a cure?—Further: I have seen three or four cases of lues in delicate females, where such distressing sickness and pain in the head, and in one of them suppression of urine, were produced by it, in the dose of two grains every night, that it was absolutely necessary to omit it. These are great objections with me to the use of opium, especially as I have reason to believe, from the observations which I have made on the subject, that the free exhibition of Peruvian Bark is capable, in a variety of instances, of rendering mercurials safe, by obviating most of the disagreeable effects which proceed from them, and some of which I shall now enumerate.

It is particularly in constitutions affected with the *irritable form* of scrophula, treated of in the last chapter, that mercury appears to be productive of the most injurious

jurious consequences ; but it is not necessary that a person should be scrupulous that this remedy should disagree with him. We are too apt to refer every case in which it proves hurtful to that disorder, when every delicate or weakly person is probably more or less liable to experience similar effects. It is not only in many instances the exciting cause of phthisis pulmonalis and rheumatism, but of dangerous hæmorrhages, erysipelatous inflammation with a tendency to terminate in gangrene, abortions in pregnant women, and the most obstinate and ill-conditioned state of buboes* and other ulcerations. To the
same

* Mr. Hunter, in his *Lectures on Surgery*, bestows particular attention in pointing out this state of buboes, and inculcating the necessity of distinguishing scrupulous from venereal ulcers, and attending to the cases in which the two are combined ; and Mr. Cline (to whom I am infinitely indebted for the instruction which I have both publicly and privately, at different times, derived from him) places in the clearest point of view, in his *Anatomical and Surgical Lectures*, the danger of persisting in the use of mercury,

same cause we must attribute tedious ulcerations in the mouth, with foetor of the breath, and loss of teeth; great disorder in the stomach and intestines, with a tendency to syncope; an immoderate discharge of saliva, profuse diarrhoea, sweating, or an unusual discharge of urine, according to the irritable condition of the respective organs; distressing pain and fullness in the head; impaired vision, and even mania itself. Lastly, a state of the most extreme debility, tremor, hectic fever, palsy, dropsy, and death, have all been known to result from the injudicious administration of mercury. These were more frequent when the pernicious practice of salivation was supposed necessary to the complete cure of the disease, but are still met with oftener than we should be inclined to suspect, from the many improvements which

mercury, when there is reason to apprehend, from the spreading of the ulcer during its employment, that too great a quantity has been already introduced into the body.

have

have been made in regulating the effects of mercury on the constitution.

In persons who are vigorous and robust, this remedy is apt to induce a state of violent inflammatory action, unless moderated by evacuations: but people of this description bear but a small proportion to the bulk of mankind; and hence a state of debility, attending the irritating action of mercury, is, in general, to be feared, and guarded against with every possible care. Now, this debility, and most of the alarming symptoms which have been mentioned, appear to be obviated in no way more certainly than by the free exhibition of Peruvian Bark, which I would earnestly inculcate in all the cases of weakly and delicate patients, who require the use of mercurials, whether of a scrophulous constitution or not.

By such a plan of treatment there is reason to expect that most of the unfavourable effects of mercury on the body may be prevented. When they have already taken place, it becomes absolutely necessary

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lary to desist from all mercurial remedies for a time, and trust to Bark, opiates, and a proper regulation of diet and cloathing, for their removal. In short, a more complete contrast in the action of medicines can scarcely be imagined, than that which is found in Bark and mercury. Mercurial remedies almost constantly quicken the pulse, heat the skin, and produce much uneasiness in the stomach and intestines. The Bark, on the contrary, increases the vigour of the body, independent of any obvious excitement or accelerated motion of the blood, and its general tendency is to invigorate the stomach, and mend the appetite. From a consideration of these circumstances, if direct facts in favour of the utility of Bark in the cases which have been mentioned were wanting, there would still be some propriety in employing it, with a view of correcting the effects of the mercury.

I have been more particularly induced to insist on this subject, from having seen cases of lues venerea, at different times, in
which

which buboes and other symptoms were daily increasing, in proportion to the quantity of mercury which was employed; and yet this pernicious plan of treatment was persisted in, till at length it became indispensably necessary to lay it aside.

The free use of sarsaparilla, as well as Peruvian Bark, is often indicated in such cases; though I have more than once known the Bark, assisted by a moderate quantity of wine, independent of any other remedy, produce, in the course of a few days, every favourable alteration that could have been expected.

Patients, after having employed mercury a great length of time, are sometimes still affected with severe pains in the limbs. These seem frequently to be of the rheumatic kind, and will now and then yield pretty readily to a strong decoction of Bark, with the tincture of guaiacum; whereas a continuation of the mercurial course is undoubtedly productive of alarming consequences. And even in cases where mercury has been used but moderately, and where there is a suspicion of the venereal virus

virus still remaining in the body, the most troublesome pains, such as originate probably from a combination of rheumatism with lues venerea, will sometimes give way more speedily to the use of Bark and guaiacum, with a small proportion of corrosive sublimate, than to a much larger quantity of mercury administered alone.

The use of Peruvian Bark in gleet has been mentioned in another part of this Essay; and it may not be improper, before this chapter is concluded, to take notice of another very troublesome complaint connected with the venereal virus, viz. the chordee, which is now and then extremely obstinate, and of a spasmodic nature, and for the cure of which, on particular occasions, Dr. Foart Simmons, in his elegant Treatise on the Gonorrhœa, recommends the Peruvian Bark.

Dr. Schwediauer also, in treating of the Gonorrhœa, advises that Bark should be given to persons of irritable constitutions, where the disease is attended with much pain and quickness of the pulse.



APPENDIX,
ON THE
CINCHONA CARRIBBEA,

INCLUDING THE
Jamaica Bark, that of St. Lucia, &c.
 With a few additional REMARKS on the
RED PERUVIAN BARK.

AS I have not had many opportunities either of making experiments on the Barks brought from the West India islands, or of seeing their exhibition in different diseases, I must trust more to the observations of others than I have done in treating of the Peruvian Bark.

It was observed in the beginning of this Essay, that two species of Cinchona had been described by Linnæus, viz.
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the *Cinchona officinalis panicula brachiata*, and the *Cinchona pedunculis unifloris*. The latter of these remains to be considered in this place, and must be supposed to comprehend every plant of the nature of *Cinchona* produced throughout the West-Indies, although the species may admit of great variety.

For several years, we were only acquainted with the Bark of the island of Jamaica, first described by Dr. Wright, in the Philosophical Transactions for the year 1777, on which I shall proceed to offer a few remarks, before any account is given of the St. Lucia Bark, which has been made the subject of observation, since that time, by different persons.

Dr. Wright observes*, that the Bark tree of Jamaica grows on stony lands near the sea-shore, is called the sea-side beech, and rises only to twenty feet; though he adds, in the Medical Commentaries of

* Philosophical Transactions, vol. lxxvii. for the year 1777, page 504.

Edinburgh,

Edinburgh *, that he had afterwards found it growing in some parts of the island to forty feet. The trunk is not thick in proportion, but hard, tough, and of a yellowish white colour on the inside. The leaves are of a rusty green colour, and the young buds of a bluish green hue. It blossoms in November, and continues in flower till February, having on the same tree or sprig, flowers and ripe pods. The flowers are of a dusky yellow colour, and the pods black. These, when ripe, split in two, and their flat brown seeds are in every respect similar to the description which has been given of the seeds of the *Cinchona officinalis*. He describes the Bark as being in general smooth and grey on the outside, though sometimes rough and scabrous; —on the inside, when well dried, of a dark brown colour. The only opportunity, which I have had of examining this

* Vol. v. page 398.

Bark, was in consequence of a small quantity with which I was favoured by Dr. Henry Cullen of Edinburgh. It was flat and thick; externally of a greyish colour, rough, cracked, and spongy;—internally, firmer, but fibrous, woody, and of a brownish colour. With regard to the taste, Dr. Wright thinks that it is at first sweet, with a mixture of the flavour of horse-radish, and of the aromatics of the east; but, when swallowed, of that very bitterness and astringency which characterise Peruvian Bark. In the pieces which I have examined, I have only been able to perceive an extremely bitter, sweetish and nauseous taste, residing more particularly in the internal lamina, the external layer or covering being nearly insipid. It is not improbable that a difference in the age, method of drying, &c. may give rise to some diversity in its sensible qualities, and that the fresh Bark may affect the organ of taste in a manner very different from the dried, or that which has been kept several years.—Reduced

duced to powder, it resembles, in colour and appearance, the common Peruvian Bark, and yields its properties plentifully both to cold and boiling water. The colour of the infusion, however, is much deeper than that of the quilled Peruvian Bark, and extremely bitter; but it appears to me, from the taste, as well as from the addition of a chalybeate solution to some of the transparent infusion, to possess but little astringency.

On the subject of its exhibition, Dr. Wright informs us, that many opportunities had occurred to him of trying its effects, especially in remitting fevers; and that after an emetic or gentle cathartic, if necessary, he had frequently administered this Bark with success; that it strengthened the stomach, checked retching and vomiting, corrected morbid humours in the *primæ viæ*, and speedily conquered the disease. It would appear, then, from the authority of this gentleman, that it must be a remedy of great efficacy; and,

although it may differ in its sensible qualities from the true *Cinchona*, it cannot be doubted that it approaches nearly to it, both from the botanical account, and from its power of subduing remittents. In situations, therefore, where neither the red nor common Peruvian Bark can be obtained of a genuine quality, or in sufficient quantity, the Jamaica Bark, or *Cinchona Jamaicensis* of Dr. Wright, if at hand, promises to be the most effectual substitute that can be employed.

I shall next attempt to describe the St. Lucia Bark, and point out the circumstances in which it appears to differ from that of the island of Jamaica.—In consequence of the trials made by Dr. Young, in St. Lucia, during the war, with a species of *Cinchona* which he had discovered there, and which he found effectual in the cure of intermittent fevers, several parcels of it were brought to London. Among others, Dr. Saunders was favoured with a quantity of it from Dr. Young,
with

with a particular account of all the facts which had been ascertained at that time concerning it. Dr. Kentish has since published some experiments, which he made on this kind of Bark; and Mr. George Wilson has communicated to the Royal Society, the observations of Mr. Davidson, surgeon at St. Lucia, with some of his own on the same subject, which are inserted in the last volume of the Philosophical Transactions*.

The Bark-tree of St. Lucia is said to be about the size of the cherry-tree, seldom thicker than the thigh, and tolerably straight; to delight in a shady situation; and to grow, in general, in a stiff, red clay.—Mr. Davidson observes, that the colour of the Bark is of a lighter red than that which was sent out, as red Bark, to the hospital, inclining more to the colour of cinnamon. This was exactly the case with a quantity which I reduced to powder; but it must follow, from the inform-

* Vol. lxxiv. for 1784, page 452.

ation of Dr. Young, that the colour must vary considerably in different parcels, being remarkably influenced by the age of the trees, by the soil, and other causes. Some pieces of this Bark are flat, thick, and reddish; others, thin, pale, and rolled up in quills. These circumstances were mentioned more fully in a former part of this treatise, in order to illustrate the nature of the red Peruvian Bark, and need only be referred to on the present occasion*.

The St. Lucia Bark, although undoubtedly procured from a species of *Cinchona*, according to Sir Joseph Banks and others, differs essentially from the *Cinchona officinalis* in several particulars. It possesses an emetic quality, not common to the true Bark, breaks more woody and splintery, and is far more nauseous to the taste, the extract resembling more the bitter of gentian than of Peruvian Bark. It agrees in many respects with the Jamaica

Bark. Among the rest, they are both extremely bitter, and have a sweetish disagreeable taste; but I have not been able to find, either from Dr. Wright's account, or from any other enquiry, that the Jamaica Bark is possessed of an emetic property; which therefore establishes a striking difference, independent of several varieties which may be traced in the botanical accounts which have been given of them.

Water and spirit both readily extract the sensible qualities of the St. Lucia Bark, the cold infusion of which, prepared by rubbing two drachms of the Bark ten or fifteen minutes with four ounces of water, is of a very deep colour, resembling in appearance a strong tincture of common Bark, and is intensely bitter. The infusion of Jamaica Bark, although the powder from which it was made was of a deeper colour than the St. Lucia, did not appear to be quite so strongly impregnated, or to be so highly coloured, as the other infusion.

It has been supposed by several persons, that the Bark of St. Lucia is not only more bitter, but more astringent, even than the red Peruvian Bark.—The bitterness is certainly of a very different kind; and, with regard to astringency, I have not been able to discover it by the taste, either in the Jamaica or St. Lucia Bark; and in precipitation with chalybeate solutions, the marks of astringency are but inconsiderable, in comparison with those exhibited by the red Bark under similar circumstances.

To warm water the St. Lucia Bark yields its properties still more readily. A pint of boiling water, poured upon an ounce of the powder, becomes instantly of a deep brown or reddish colour, and is, if possible, still more bitter than the cold infusion.

A curious part of the chemical nature of this Bark remains to be mentioned. I was favoured lately by Mr. George Wilson, a gentleman well known to many of the profession for his ingenuity and abilities,

lities, with a small quantity of a thickish deep green oily substance, which, he informed me, he had procured from the St. Lucia Bark, during the preparation of the spirituous extract. He has since furnished me with an account of the manner in which it was obtained, which I shall insert in his own words.—“ In the month
 “ of February last, I put, to one pound of
 “ the St. Lucia Bark in fine powder, six
 “ pints of rectified spirit of wine, and digested them together for six weeks,
 “ then filtered off the tincture, and proceeded to evaporate it to the consistence
 “ of an extract. By an unlucky accident,
 “ before the process was completed, the
 “ pan tilted over, and only one pint of
 “ the tincture was saved; which yielded
 “ eight scruples of extract, greatly loaded
 “ with a deep green oil, very acrid and
 “ bitter to the taste. I separated, by pressure, one drachm and a half of this oil,
 “ and the extract still continued to be
 “ loaded with it, through the whole of
 “ its substance. The oil is very active.
 “ It

“ It is so very disagreeable, and dwells so
“ long on the taste, that the least touch
“ of it with the tongue produces nausea.
“ A single drop occasioned a tedious and
“ intolerable sickness in my apprentice,
“ who tasted it. The taste of the extract
“ thus prepared is the same, and but lit-
“ tle inferior in its effects.
“ Having completed my process with
“ the spirituous digestion, I poured upon
“ the residuum, from which the tincture
“ had been filtered, three gallons of water.
“ These were boiled together very care-
“ fully, and more water was added from
“ time to time, until the quantity it was
“ boiled in amounted to nine gallons.
“ The whole was then reduced to three
“ gallons, which being strained cautiously
“ through fine canvas, and then evapo-
“ rated to an extract of a proper pilular
“ consistence, yielded twelve ounces and
“ seven drachms. This was quite free
“ from oil, and, although very bitter, did
“ not, on tasting, produce the nausea as
“ above - mentioned. There remained,
“ after

“after these processes with the spirit and
“water, an insipid earth, weighing six
“ounces two drachms.

“Of the watery extract, my apprentice
“took a scruple repeatedly, without ex-
“periencing any nauseating effects; where-
“as less than half that quantity of the
“Bark in substance, or even two or three
“grains of the spirituous extract, never
“fail to excite nausea, and most common-
“ly vomiting also. I think, therefore,
“that we may fairly conclude the emetic
“quality to be resident in the green oil
“and resin, and that it is not improbable,
“if the oil could be entirely separated,
“that the pure resin would lose almost
“(if not altogether) these effects.

“It remains now to be tried, whether
“the watery extract, thus deprived of the
“emetic quality, still retains its febrifuge
“properties; which I have yet had no op-
“portunity of determining.”

I cannot help regretting that the above
account was not in my possession sooner.
Almost the whole of the foregoing part
of

of the treatise was printed when it came to me; so that I have not been able to repeat the process on an extensive scale. From six or seven ounces of the spirituous tincture of St. Lucia Bark, however, evaporated to a pilular consistence by the water bath, neither my friend Mr. Babbington, of Guy's Hospital, nor myself, could obtain any thing oily; and the St. Lucia Bark, in distillation with water, yields nothing of an oily nature. If the green oil, then, in question does really exist in this kind of Bark, and is not produced in consequence of any decomposition or alteration in the resin, by too great a degree of heat, it will form a remarkable exception to vegetables in general; from which, I believe, there is scarcely an instance of an oil being thus procured; most essential oils being separated in distillation with water.

But, at any rate, this green oil possesses very curious properties; and it is to be hoped that Mr. Wilson will investigate the subject farther, and take an opportunity

of communicating to the public the result of his enquiries.

The small quantity of the oil, which Mr. Wilson kindly put into my hands, was perfectly inflammable, lighter than water, and had not the slightest tendency to unite with it. In rectified spirit, it dissolved completely and instantly, and imparted a greenish colour. A few drops of it, exposed to heat in a tea-spoon, discharged an offensive smoke or vapour, till at length a small portion of a fixed blackish substance remained behind, not completely soluble in spirit, and requiring the assistance of heat before any solution at all appeared to take place. The smell of it was somewhat empyreumatic, and the taste of the same kind, joined with a most disagreeable bitter.

It is not improbable that most of the islands in the West Indies produce plants of the nature of the Cinchona; but it must be determined in future, whether they are all varieties only, or can be referred with propriety to different species. I recollect to have

have brought with me to England, from the island of Barbadoes, some pieces of a bitter Bark, at the desire of Mr. Joshua Steel, a gentleman of extensive philosophical knowledge, which he wished to be examined more particularly by his friends Sir John Pringle, Sir Joseph Banks, and Dr. Watson; but as the botanical account of the plant was imperfect, nothing certain could be determined with regard to it. It is probable, notwithstanding, that it is a variety of the *Cinchona Caribbæa*, as the Bark resembled that of St. Lucia in appearance and sensible qualities.

In the printed minutes, also, of the Society of Arts, &c. at the island of Barbadoes, is inserted a letter from Dr. Goulding, an eminent physician there, inclosing an account, which he had received from Dr. Anderson, at St. Vincent's, of the discovery of a new species of *Cinchona*, which appeared to be the celebrated red Bark, some of the seeds of which he had likewise sent to Barbadoes.

When the St. Lucia Bark was first tried,
10 in

in the island from which it receives its name, we are informed, both by Dr. Young and Mr. Davidson, that its strong emetic and purgative qualities prevented its exhibition, but that the best success had been experienced afterwards from some of it, which had been kept a long time, and was sufficiently dried. It was employed chiefly in the form of infusion, in aq. calcis, or in simple water, in the proportion of one ounce to three pints. In substance, it was given from twenty to thirty grains for a dose, never exceeding the latter quantity, as it was found that the stomach would seldom retain more than twenty grains. It would seem that the St. Lucia Bark had also been tried by some of the surgeons in the navy, during the war; but, as Dr. Blane, in his treatise on the diseases of seamen, lately published, has not given any account of it, we must conclude, that the trials were not sufficiently numerous, or that it did not answer the expectations which had been formed of it.

The trials which have been made with this

this kind of Bark in the hospitals in London, and in the infirmary at Edinburgh, have not been so much in its favour as was expected, from the account of its having cured intermittents at St. Lucia, after the common Peruvian Bark had failed. In doses of half a drachm, although it was well dried, it produced nausea in several of the patients to whom it was administered by Dr. Saunders, in Guy's Hospital; and, as it discovered no remarkable efficacy in speedily subduing the intermittents, it was laid aside.—Dr. Kentish, who has treated of its medical effects, as well as its chemical qualities, attributes the want of success to its having been given in too large doses; and adds, that he has experienced its good effects in doses of five or ten grains, joined with canella alba. But, although we may express ourselves indebted to him for this information, and although we should allow that the St. Lucia Bark may prove a remedy for intermittent fevers, and other diseases where bitters and tonics are required, yet we cannot
help

help thinking that Dr. Kentish has been too sanguine in his opinion, and that he has hastily and improperly called in question the superior efficacy of the red Bark.

He has mentioned several authorities to prove, that, in Edinburgh, it had not answered the character which had been given of it by Dr. Saunders; to which it may be observed, that intermittents are seldom met with at that place, and consequently that the trials which were made with it were not sufficiently numerous to admit of any decisive inference: and again, it was certainly difficult to obtain genuine red Bark in that city. Unless the good pieces were carefully picked out from the bad, I could find but few druggists there, who were able to furnish it in a perfect condition. On the strength of a single case, too, the red Bark is condemned by Dr. Kentish, as having produced an unfavourable state of an ulcer, which was altered for the better on returning to the use of common Peruvian Bark, which had been given in the beginning. Mr. Bell, in the last edi-

tion of his Treatise on Ulcers, has published a case so very similar, that it appears to be the same with that just referred to. I cannot help expressing my surprise, with many others who have taken notice of it, that a gentleman of Mr. Bell's character should have drawn so hasty a conclusion, and should not have endeavoured to distinguish with greater care between the effects of a remedy and accidental circumstances.

But we are even told by Dr. Kentish, that the use of the red Bark is on the decline; in which I may venture to say he is much mistaken, unless it be meant, that, from the high price of it, few persons can afford to employ it in ordinary cases of disease. The scarcity of it has in several instances led to the most flagrant abuses, such as substituting in its place other kinds of Bark, and attempting to imitate it by the assistance of different colouring materials.

There is no difficulty in detecting such tricks, if the sensible qualities of the article,

cle, and the taste more especially, be attended to, by such as have been accustomed to genuine red Bark : and it is to be hoped, that all who in future may be disposed to call in question the powers of this valuable remedy, will be cautious in ascertaining the exact quality of that which was administered, in discriminating the effects of remedies from the progress of disease and accidental symptoms, and in bringing forward such a number of cases, as, upon reflection and candid examination, will support the conclusion which they wish to establish.

An importation from Spain of thirty chests of red Bark within the few last weeks, and an additional quantity which is soon expected, will, I trust, reduce the price of it, and render its use again general.

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